



Sun Management Center Change Manager 1.0 Administration Guide

Sun Microsystems, Inc.
4150 Network Circle
Santa Clara, CA 95054
U.S.A.

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Contents

Preface 13

1 Sun Management Center Change Manager (Overview) 19

Change Manager Features 19

Change Manager Overview (Task Map) 20

User Overview 22

2 Hardware and Software Requirements (Reference) 25

Change Manager Server 25

Change Manager Server Requirements 26

Master System 27

Master System Requirements 27

Managed Hosts 28

Managed Host Requirements 28

3 Installing, Configuring, and Accessing the Change Manager Server (Tasks) 29

Overview 30

Managed Data Objects 30

Change Manager File Repository 30

Sun Management Center Topology 30

Change Manager Database Tables 31

Configuration Data 31

Setting Up Change Manager 31

Initialization 31

Uninstallation 32

Backup and Restore	32
Installing and Configuring the Change Manager Server (Task Map)	33
Installing and Configuring the Change Manager Server	35
▼ How to Install Sun Management Center 3.0 Update 4 Server Software on the Change Manager Server	35
▼ How to Install the Sun Management Center 3.0 Jumbo Patch for Solaris 8 and Solaris 9 on the Change Manager Server	39
▼ How to Install Change Manager Server Software on the Change Manager Server	40
Installing and Configuring the Change Manager Server (Optional Tasks)	42
▼ How to Disable the SNMP Daemon to Avoid Port 161 Conflict	42
▼ How to Start the Web Server on the Change Manager Server	42
▼ How to Uninstall Change Manager Server Software From the Change Manager Server	42
▼ How to Reinstall Change Manager Server Software on the Change Manager Server	43
▼ How to Regenerate the Security Keys by Changing the Seed	44
Configuring the Change Manager Server by Using the <code>ichange.cfg</code> File	45
Authorizing Users to Access Change Manager	45
▼ How to Add Sun Management Center Change Manager Users	45
Accessing the Change Manager Server by Using the Browser Interface	46
▼ How to Log In to the Change Manager Server (Web Browser)	46
▼ How to Change the Timeout Value for the Browser Console Session	49
▼ How to Get Help (Web Browser)	49
▼ How to Get Glossary Definitions (Web Browser)	49
Accessing the Change Manager Server by Using the Command-Line Interface	49
▼ How to Initiate a Change Manager Session (Command Line)	50
▼ How to Authenticate a User (Command Line)	52
4 Creating a Deployable Solaris Flash Archive (Tasks)	53
Creating Software Stacks	53
Choosing the Master System	54
Installing Software on the Master System	55
Addressing Hardware Differences Between a Master System and Managed Hosts	55
Installing the Sun Management Center and Change Manager Agents on a Master System (Task Map)	56
Installing the Sun Management Center and Change Manager Agents on a Master System	57

▼ How to Install Sun Management Center 3.0 Update 4 Agent Software	57
▼ How to Install Change Manager Agent Software	59
Unconfiguring Software Applications	59
Other Considerations	60
Creating the Solaris Flash Archive From the Master System	60
Creating a Customizable Solaris Flash Archive	61
Creating the Archive Parameters File	62
Processing the Archive Parameters File With Finish Scripts	62
Using <code>flar create</code> to Create a Customizable Solaris Flash Archive	64
5 Installing Solaris Flash Archives on Managed Hosts (Tasks)	65
Solaris Deployment Technologies Used by Change Manager	66
Solaris Flash Installation	67
Solaris Live Upgrade	67
Custom JumpStart Installation	68
Change Manager Deployment File Types	68
Shared Profile	69
Solaris Boot Image	71
Solaris Flash Archive	71
Folder	72
Installing Solaris Flash Archives on Managed Hosts by Using the Browser Interface (Task Map)	73
Installing Solaris Flash Archives on Managed Hosts by Using the Browser Interface	75
▼ How to Access the Files Section and Appropriate Folder (Web Browser)	75
▼ How to Import Solaris Boot Images to the Change Manager Repository (Web Browser)	76
▼ How to Import Solaris Flash Archives to the Change Manager Repository (Web Browser)	77
▼ How to Create a Shared Profile (Web Browser)	77
▼ How to Import a Shared Profile to the Change Manager Repository (Web Browser)	78
▼ How to Access the Hosts Section and Appropriate Administrative Domain and Host Group (Web Browser)	78
▼ How to Add a Managed Host (Web Browser)	79
▼ How to Perform an Initial Installation (Web Browser)	80
▼ How to Reinstall, Update, Fall Back, and Reboot Managed Hosts (Web Browser)	81

Installing Solaris Flash Archives on Managed Hosts by Using the Command-Line Interface (Task Map) 83

Installing Solaris Flash Archives on Managed Hosts by Using the Command-Line Interface 84

- ▼ How to Import Solaris Boot Images to the Change Manager Repository (Command Line) 85
- ▼ How to Import Solaris Flash Archives to the Change Manager Repository (Command Line) 87
- ▼ How to Import Shared Profiles to the Change Manager Repository (Command Line) 88
- ▼ How to Add Managed Hosts (Command Line) 89
- ▼ How to Perform an Initial Installation (Command Line) 91
- ▼ How to Reinstall Managed Hosts (Command Line) 92
- ▼ How to Update Managed Hosts (Command Line) 93
- ▼ How to Fall Back to the Previous Version of the Software Stack (Command Line) 94
- ▼ How to Reboot Managed Hosts (Command Line) 95
- ▼ How to Halt Managed Hosts (Command Line) 95

6 Auditing Software Configurations (Tasks) 97

Using Audit Software 97

Change Manager Audit File Types 98

Audit Rules File 99

Manifest 100

Report 101

Folder 101

Auditing Software Configurations by Using the Browser Interface (Task Map) 102

Auditing Software Configurations by Using the Browser Interface 103

- ▼ How to Access the Files Section and Appropriate Folder (Web Browser) 103
- ▼ How to Create an Audit Rules File (Web Browser) 103
- ▼ How to Import an Audit Rules File to the Change Manager Repository (Web Browser) 104
- ▼ How to Import a Manifest to the Change Manager Repository (Web Browser) 104
- ▼ How to Access the Hosts Section and Appropriate Administrative Domain and Host Group (Web Browser) 105
- ▼ How to Add a Managed Host (Web Browser) 105
- ▼ How to Build Manifests for Managed Hosts (Web Browser) 107
- ▼ How to Audit Managed Hosts (Web Browser) 108

▼ How to Get the Software Status of Managed Hosts (Web Browser)	109
Auditing Software Configurations by Using the Command-Line Interface (Task Map)	111
Auditing Software Configurations by Using the Command-Line Interface	112
▼ How to Import Audit Rules Files to the Change Manager Repository (Command Line)	112
▼ How to Import Manifests to the Change Manager Repository (Command Line)	113
▼ How to Add Managed Hosts (Command Line)	115
▼ How to Build Manifests for Managed Hosts (Command Line)	116
▼ How to Audit Managed Hosts (Command Line)	117
▼ How to Get the Software Status of Managed Hosts (Command Line)	118
7 Monitoring Jobs (Tasks)	121
Job Queue and Logs	121
Job Queue	122
Job Log	122
Transaction Log	123
Monitoring Jobs by Using the Browser Interface (Task Map)	123
Monitoring Jobs by Using the Browser Interface	124
▼ How to View the Job Queue (Web Browser)	124
▼ How to Cancel Jobs (Web Browser)	124
▼ How to Reschedule a Running Job (Web Browser)	125
▼ How to Purge Completed Jobs From the Job Queue (Web Browser)	126
▼ How to View the Job Log (Web Browser)	126
▼ How to View the Transaction Log (Web Browser)	126
Monitoring Jobs by Using the Command-Line Interface (Task Map)	127
Monitoring Jobs by Using the Command-Line Interface	127
▼ How to View the Status of Jobs (Command Line)	127
▼ How to Cancel Jobs (Command Line)	129
▼ How to Purge Completed Jobs From the Job Queue (Command Line)	130
8 Maintaining the Change Manager Repository (Tasks)	131
Maintaining the Change Manager Repository by Using the Browser Interface (Task Map)	132
Maintaining the Change Manager Repository by Using the Browser Interface	133
▼ How to Access the Files Section and Appropriate Folder (Web Browser)	134
▼ How to Create a Folder (Web Browser)	134

▼ How to Rename a File or Folder (Web Browser)	134
▼ How to Export a File From the Change Manager Repository (Web Browser)	135
▼ How to Create a Copy of a File (Web Browser)	135
▼ How to Move Files and Folders to Another Folder (Web Browser)	136
▼ How to Delete Files and Folders (Web Browser)	136
▼ How to View Folder Contents (Web Browser)	136
▼ How to View or Modify File Properties (Web Browser)	137
Maintaining the Change Manager Repository by Using the Command-Line Interface (Task Map)	137
Maintaining the Change Manager Repository by Using the Command-Line Interface	138
▼ How to Create a Folder (Command Line)	139
▼ How to Rename a File or Folder (Command Line)	139
▼ How to Export Files to Another System (Command Line)	140
▼ How to Move Files and Folders to Another Folder (Command Line)	141
▼ How to Delete Files and Folders (Command Line)	142
▼ How to View Folder Contents (Command Line)	142
▼ How to View File or Folder Properties (Command Line)	144
▼ How to Modify File or Folder Properties (Command Line)	145
9 Maintaining the Change Manager Topology (Tasks)	147
Change Manager Host Object Types	147
Host Group	148
Managed Host	148
Maintaining the Change Manager Topology by Using the Browser Interface (Task Map)	150
Maintaining the Change Manager Topology by Using the Browser Interface	151
▼ How to Access the Hosts Section and Appropriate Administrative Domain and Host Group (Web Browser)	151
▼ How to Create a Host Group (Web Browser)	152
▼ How to Rename a Managed Host or Host Group (Web Browser)	152
▼ How to Copy Managed Hosts to Another Host Group (Web Browser)	153
▼ How to Move Managed Hosts and Host Groups to Another Host Group (Web Browser)	154
▼ How to Remove Managed Hosts and Host Groups (Web Browser)	154
▼ How to View the Contents of a Host Group (Web Browser)	155
▼ How to View or Modify Managed Host Properties (Web Browser)	155

Maintaining the Change Manager Topology by Using the Command-Line Interface
(Task Map) 156

Maintaining the Change Manager Topology by Using the Command-Line Interface
157

▼ How to Specify the Administrative Domain in Which to Add Hosts (Command
Line) 157

▼ How to Create a Host Group (Command Line) 158

▼ How to Rename a Managed Host or Host Group (Command Line) 159

How to Copy Managed Hosts to Another Host Group (Command Line) 159

▼ How to Move Managed Hosts and Host Groups to Another Host Group
(Command Line) 160

▼ How to Remove Managed Hosts and Host Groups (Command Line) 161

▼ How to View the Contents of a Host Group (Command Line) 161

▼ How to View Managed Host Properties (Command Line) 163

▼ How to Modify Managed Host Properties (Command Line) 164

▼ How to View Host Group Properties (Command Line) 166

▼ How to Modify Host Group Properties (Command Line) 166

10 Creating Shared Profiles and Host Properties (Reference) 169

Parameters Used by Shared Profiles and Host Properties 169

Managed Host Parameters 169

Archive Parameters 170

Sysid Parameters 170

Disk Layout Parameters 173

Minimum Set of Parameters to Deploy Software 176

11 Auditing Software Configurations (Reference) 177

Audit Rules File Format 177

Syntax 177

Rule Blocks 178

Pattern Matching Statements 179

File Attributes 180

Rules File Example 180

Manifest File Format 181

Manifest File Entries 181

Quoting Syntax 183

Manifest Output Example 183

Comparison Report Format 184

A	Navigating Through the Change Manager Browser Interface (Reference)	185
	General Change Manager Links Area	185
	Log Out and Help Buttons	185
	Section Tabs	186
	Navigation Bread Crumbs	192
	Drop-Down Menus	193
	Guidelines for Navigating Folders and Host Groups	193
	Guidelines for Navigating the Wizards	194
B	Troubleshooting (Tasks)	195
	Change Manager Server Installation Problems	195
	patchadd -p Issues PatchArrElem Error on Solaris 8	196
	User Interface Problems	196
	General User Interface Problems	196
	Browser Interface Problems	198
	Command-Line Interface Problems	201
	Software Deployment Problems	202
	Custom JumpStart Installation Launches the Interactive Installation Program	202
	Managed Host Hangs While Booting From the Network (4656587)	203
	Panic: unable to mount file systems Message Appears While Booting From the Network	203
	Interactive Installation Program Launched When Files For Non-Existent Managed Hosts Not Cleaned Up (4721489)	205
C	Security (Reference)	207
	Users As Security Risks	207
	Secure Communication and File Transfer Channels	208
	Browser to User Interface	208
	Secure File Transfers	209
	User Interfaces to Change Manager Server	210
	Change Manager Data Storage	210
	Sun Management Center SNMP Control	211
	Using Sun Management Center Probe Connection to Retrieve Bulk Data From Managed Hosts	212
	Performing Initial Installations by Using RARP	213
	Performing Initial Installations by Using bootparams	213
	Performing Initial Installations by Using TFTP	214

NFS Access by Managed Hosts	214
Terminal Access	215

Glossary	217
----------	-----

Index	225
-------	-----

Preface

This administration guide describes the Sun™ Management Center Change Manager, henceforth referred to as Change Manager, software product. Administrators can use this book to learn how the Change Manager works. The Change Manager application can install software stacks, which are encapsulated as Solaris™ Flash archives, on large numbers of replicated systems.

The Change Manager application can also validate the software contents of managed hosts. This validation is accomplished by comparing the contents of managed hosts over time with a baseline manifest.

Who Should Use This Book

This book is intended for anyone responsible for performing one or more of these Change Manager operations:

- Installing the Change Manager software on the Change Manager server
- Managing deployment objects and audit objects in the Change Manager repository
- Managing hosts on the Change Manager server
- Creating the Solaris Flash archives for use with the Change Manager
- Deploying software stacks to managed hosts
- Auditing software on managed hosts

How This Book Is Organized

- Chapter 1 provides an overview of the Change Manager product.
- Chapter 2 describes the hardware and software requirements for using the Change Manager product.
- Chapter 3 provides instructions on installing and configuring the Sun Management Center and Change Manager software on the Change Manager server.
- Chapter 4 describes how to create customizable Solaris Flash archives that can be deployed to managed hosts.
- Chapter 5 describes how to set up the deployment-related files in the repository, add managed hosts, and deploy software.
- Chapter 6 describes how to set up the audit-related files in the repository, add managed hosts, run audit jobs, and view audit reports.
- Chapter 7 describes how to monitor jobs in the job queue, job log, and transaction log.
- Chapter 8 describes how to perform file maintenance tasks on the Change Manager repository. This chapter also describes how to view and modify file and folder properties.
- Chapter 9 describes how to perform maintenance tasks on the Change Manager topology. This chapter also describes how to view and modify managed host and host group properties.
- Chapter 10 describes the shared profile properties that must be set to deploy software to managed hosts. The chapter also shows the minimum set of properties that must be specified to successfully deploy software.
- Chapter 11 describes the file formats for the three audit-related files.
- Appendix A describes how to navigate through the Change Manager browser interface.
- Appendix B lists problems, warning messages, and error messages that you might see when using Change Manager.
- Appendix C describes the security issues addressed by Change Manager.
- Glossary is a list of terms used in this book and their definitions.

Related Books

- *Sun Management Center Change Manager 1.0 Release Notes*

Read this book for information about bugs and issues that pertain to the installation and configuration of the Change Manager server.

- *Sun Management Center Change Manager 1.0 Reference Manual*

Read this book to see the Change Manager man pages.

- *Solaris 9 Installation Guide*

Read this book for more detailed information about installing Solaris software. In particular, read the chapters that cover custom JumpStart™ installation, Solaris Flash installation, and Solaris Live Upgrade.

- *Sun Management Center 3.0 Software Installation Guide*

Read this book for more detailed information about installing the Sun Management Center 3.0 software.

- *Sun Management Center 3.0 Software User's Guide*

Read this book for information about using the Sun Management Center 3.0 product. In particular, read the chapters that cover administrative domains and access control.

- *Sun Management Center 3.0 Configuration and Deployment Guide*

Read this book for information about authorized users and security for the Sun Management Center 3.0 product.

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Typographic Conventions

The following table describes the typographic changes used in this book.

TABLE P-1 Typographic Conventions

Typeface or Symbol	Meaning	Example
AaBbCc123	The names of commands, files, and directories; on-screen computer output	Edit your <code>.login</code> file. Use <code>ls -a</code> to list all files. <code>machine_name%</code> you have mail.
AaBbCc123	What you type, contrasted with on-screen computer output	<code>machine_name%</code> su Password:
<i>AaBbCc123</i>	Command-line placeholder: replace with a real name or value	To delete a file, type <code>rm filename</code> .
<i>AaBbCc123</i>	Book titles, new words or terms, or words to be emphasized	Read Chapter 6 in the <i>User's Guide</i> . These are called <i>class</i> options. Do <i>not</i> save changes yet.

Shell Prompts in Command Examples

The following table shows the default system prompt and superuser prompt for the C shell, Bourne shell, and Korn shell.

TABLE P-2 Shell Prompts

Shell	Prompt
C shell prompt	<code>machine_name%</code>
C shell superuser prompt	<code>machine_name#</code>
Bourne shell and Korn shell prompt	<code>\$</code>
Bourne shell and Korn shell superuser prompt	<code>#</code>

Change Manager Naming Conventions

Change Manager object names and path component names can include the following characters:

- Letters (a-z and A-Z)
- Numbers (0-9)
- At (@)
- Equals (=)
- Hyphen (-)
- Period (.)
- Plus (+)
- Underscore (_)

These characters can appear at any position in a name. However, the period character cannot appear at the beginning of a name.

Tab characters and newline characters are not permitted.

Path components are delimited by the slash (/) character.

Sun Management Center Change Manager (Overview)

The Sun™ Management Center Change Manager, henceforth referred to as Change Manager, is a system management application that enables system administrators to quickly and efficiently install and manage *Solaris™ Flash archives* across a large number of *managed hosts*. System administrators can create consistent software configurations that are easier to manage. System administrators can also improve their ability to know exactly what is running on their managed hosts by using the Change Manager.

Change Manager is based on the Sun Management Center service and agent infrastructure. In this release, a single instance of the Sun Management Center service and agent layers support both the Sun Management Center console and Change Manager. Plans for a future release of Sun Management Center include a shared web-based user interface. Then, Change Manager functionality should be available from the Sun Management Center console. Sun Management Center features, such as system monitoring, should also be available from the Change Manager console.

The following topics are covered in this chapter:

- “Change Manager Features” on page 19
- “Change Manager Overview (Task Map)” on page 20
- “User Overview” on page 22

Change Manager Features

Change Manager enables system administrators to quickly and easily install, configure, update, and audit software running on large groups of replicated systems.

Key to accomplishing these tasks is the *software stack*, a set of one or more software elements installed as a Solaris Flash archive on a managed host. The stack is a well-defined set of files, which must include, at a minimum, the Solaris operating environment. For example, a software stack might include the Solaris 9 operating environment, with the Apache web server, and the Oracle® database.

Following are the main features of Change Manager:

- Quick and easy deployment of integrated software stacks, which are in the form of Solaris Flash archives, to managed hosts
- Rapid reprovisioning of systems to adapt to changes in the computing needs of your business
- Installation of software on a cloned set of managed hosts while they continue to run, by using the Solaris Live Upgrade feature
- Easy creation of reference software configurations for the managed hosts
- Easy maintenance of reference software configurations for the managed hosts
- Scheduling and automation of software installations or reprovisioning of services
- Audit of software stacks that are running on any managed host or groups of managed hosts
- Easy-to-use browser-based interface (see Appendix A) as well as a command-line interface for scripting and for use by expert users (see `changemgr(1MCM)`)

Change Manager Overview (Task Map)

The following task map shows what you need to do to install managed hosts by using Change Manager.

Task	Description	For Instructions
If you want, install the Sun Management Center 3.0 Performance Reporting Manager.	Install and configure the Sun Management Center 3.0 Performance Reporting Manager before installing Change Manager.	See <i>Sun Management Center 3.0 Performance Reporting Manager User's Guide</i> .
Install the Change Manager server.	Install and configure the Change Manager server with Sun Management Center 3.0 and Change Manager 1.0 software.	See Chapter 3.

Task	Description	For Instructions
Create a customizable Solaris Flash archive.	<p>Create a customizable Solaris Flash archive on a master system.</p> <ul style="list-style-type: none"> ■ Install and configure software on a master system ■ Determine which software parameters the deployment user should be able to set at deployment time ■ Write <i>deployment finish scripts</i> to process the user-supplied values at deployment time. These scripts customize the software for its operational environment ■ (Optional) Create a <i>baseline manifest</i> of the software stack ■ Create a Solaris Flash archive 	See Chapter 4.
Populate the Change Manager repository and topology.	<p>Populate the Change Manager repository with files needed to run deployment and audit jobs. You can create some files by using the user interface and you can import existing files to the repository.</p> <p>Populate the Change Manager topology with managed hosts on which to run the deployment and audit jobs.</p>	<p>See Chapter 5 if you are preparing to perform software installations by using Change Manager.</p> <p>See Chapter 6 if you are preparing to audit managed hosts that are already installed by Change Manager.</p>
Run deployment jobs.	<p>Run deployment jobs on managed hosts or groups of managed hosts.</p> <ul style="list-style-type: none"> ■ Set up installation profiles ■ Install managed hosts ■ Update managed hosts ■ Reinstall managed hosts ■ Fall back to the previous boot environment ■ Reboot managed hosts ■ Halt managed hosts 	See Chapter 5.
Run audit jobs and view audit reports.	<p>Run audit jobs on managed hosts or groups of managed hosts.</p> <ul style="list-style-type: none"> ■ Build manifests for managed hosts ■ Audit managed hosts ■ Get the software status of managed hosts <p>Also, view the output of audit jobs.</p>	See Chapter 6.

Task	Description	For Instructions
Monitor jobs.	Monitor jobs by examining the job queue and logs.	See Chapter 7.
Maintain the Change Manager repository and topology.	<p>Maintain deployment and audit files in the Change Manager repository. Also maintain managed hosts in the Change Manager topology.</p> <ul style="list-style-type: none"> ■ Repository <ul style="list-style-type: none"> ■ Create folders ■ Rename files and folders ■ Import files ■ Export files ■ Create copies of shared profiles and audit rules files ■ Move files and folders to other folders ■ Delete files and folders ■ Topology <ul style="list-style-type: none"> ■ Create host groups ■ Rename managed hosts and host groups ■ Copy managed hosts and host groups to other host groups ■ Move managed hosts and host groups to other host groups ■ Remove managed hosts and host groups 	<p>See Chapter 8 if you are maintaining the Change Manager repository.</p> <p>See Chapter 9 if you are maintaining the Change Manager topology.</p>

User Overview

Typically, Change Manager operations can be performed by three classes of administrator: server administrator, deployment user, and software stack creator. Sometimes the duties performed by each user might overlap. These users perform the following functions:

- **Server administrator** – Installs and administers the Change Manager software on the Change Manager server
- **Deployment user** – Uses the Change Manager server to manage hosts
 - Manages the Change Manager repository of file objects, such as Solaris Flash archives and associated installation boot images
 - Gathers objects required for deployment tasks, such as Solaris boot images

- Creates objects required for audit tasks, such as audit rules files
- Adds systems to be managed by the Change Manager
- Creates host groups, which are collections of managed hosts
- Schedules deployment operations
- Schedules audit operations
- Installs Solaris Flash archives on managed hosts
- Audits the software contents of managed hosts
- Manages manifests and audit rules files
- Monitors the status of long-running management operations
- Views the reports, such as manifest comparison reports or software status reports
- Views the job log to diagnose failed operations
- **Software stack creator** – Creates the software stacks to be deployed by the Change Manager, but this function is optional if you plan to install existing Solaris Flash archives

Hardware and Software Requirements (Reference)

This chapter describes the hardware and software requirements for the following:

- “Change Manager Server” on page 25
- “Master System” on page 27
- “Managed Hosts” on page 28

The systems must meet these hardware and software requirements prior to installation of the Change Manager product.

Requirements are for the Change Manager server and the master systems only. Managed hosts should match the configuration of the master system as much as possible. The software stack built on the master system is later installed on the managed hosts.

Change Manager Server

The *server* runs the Change Manager software. The server stores information about managed hosts. The server also stores files that are used for Change Manager operations.

Deployment files, such as Solaris Flash archives and shared profiles, are used as input for deployment tasks. Audit files, such as audit rules files and manifests, are used as input and output for audit tasks. These files must be stored in the Change Manager repository to be used for deployment tasks and audit tasks. See Chapter 5 and Chapter 6.

From the server, you can *deploy* software to one or more managed hosts. You can also audit one or more managed hosts.

You can access the server through the browser interface or through the command-line interface. The command-line interface *must* be run on the Change Manager server.

For instructions on installing the Change Manager server, see Chapter 3.

Change Manager Server Requirements

The Change Manager server must run Sun Management Center 3.0 Update 4, Patch 6 (or later) software as well as Change Manager software.

The following requirements must be met before you install the Change Manager software on the Change Manager server:

- **Operating environment:**
 - Solaris 8 2/02, at least the Developer Software Group.
 - Solaris 9, at least the Developer Software Group.
- **Memory:** 512 Mbytes of RAM available to run the Sun Management Center software
- **Disk space:**
 - 770 Mbytes for the Sun Management Center software in `/var/opt/SUNWsymon`.
 - 480 Mbytes for Sun Management Center patches in `/var/sadm/pkg`.
 - A local disk *slice* to hold the Change Manager database and repository. The repository holds objects, such as Solaris Flash archives, Solaris boot images, and managed host data. The space required depends on the application, but typically, a minimum of several gigabytes is needed.



Caution – The Change Manager database and repository *must* be stored on a local disk of the Change Manager server.

- **Software:**
 - Sun Management Center 3.0 Server and Agent Layers.
 - Sun Management Center 3.0 Premiere Management Applications.
 - Patch 110938, Sun Management Center 3.0 Update 4 (version 6 or later).
Download the patch from SunSolveSM Web site.

Master System

This system is used to build a software stack. The master system's hardware configuration should represent the hardware configuration of the managed hosts. The software stack is to be deployed to the managed hosts. The software stack is encapsulated in the form of a Solaris Flash archive.

The master system must include some of the Change Manager packages. These packages include the agent software and the audit tools. This software enables the systems that are installed with the archive to be managed by the Change Manager server.

The software stack creator can make the stack customizable by embedding a description of the software parameters and *deployment finish scripts* in the archive. At deployment time, the finish scripts process the *parameter* values provided by the deployment user, customizing the software as required.

The deployment user specifies values for these software parameters as a *shared profile* or as being associated with the managed host itself, in which case the parameters are referred to as *host properties*.

For instructions on installing the master system, see Chapter 4.

Master System Requirements

The following requirements must be met before you install the Change Manager software on the master system:

- **Operating environment:** Solaris 8 2/02 or Solaris 9.
- **Disk space:** 18 Mbytes.
- **Software:**
 - Sun Management Center 3.0 Agent Layer.
 - Sun Management Center 3.0 Premier Management Applications.
 - Patch 110938, Sun Management Center 3.0 Update 4 (version 6 or later).
Download the patch from SunSolve Web site.

Managed Hosts

Managed hosts are controlled by Change Manager operations, such as initial installation, update, and audit. Managed hosts *must* be added to the Change Manager server to act as Change Manager targets. Managed hosts also must be visible to the server through the appropriate *naming service* scheme.

For instructions on deploying software to managed hosts, see Chapter 5.

Managed Host Requirements

To simplify replicated system management, ensure that the hardware configuration of the master system and managed hosts match as closely as possible. The best match is an identical hardware configuration.

Each replicated managed host must have the following data registered in the appropriate naming service databases:

- Host name
- IP address

For example, if the network uses the NIS naming service, update the `hosts` database. Add the host name and IP address to the `hosts` database.

Installing, Configuring, and Accessing the Change Manager Server (Tasks)

The Change Manager server is the system that runs the Change Manager software. Deployment-related objects and audit-related objects are also stored on the server. The Change Manager server runs a web server that supports the web-based Change Manager applications. The server can also run the command-line interface version of the Change Manager applications.

The Change Manager files and managed hosts must be on the Change Manager server to perform deployment tasks and audit tasks.

This chapter covers the following:

- “Overview” on page 30
- “Managed Data Objects” on page 30
- “Setting Up Change Manager” on page 31
- “Installing and Configuring the Change Manager Server (Task Map)” on page 33
- “Installing and Configuring the Change Manager Server” on page 35
- “Installing and Configuring the Change Manager Server (Optional Tasks)” on page 42
- “Configuring the Change Manager Server by Using the `ichange.cfg` File” on page 45
- “Authorizing Users to Access Change Manager” on page 45
- “Accessing the Change Manager Server by Using the Browser Interface” on page 46
- “Accessing the Change Manager Server by Using the Command-Line Interface” on page 49

For an overview of the Change Manager work flow, see “Change Manager Overview (Task Map)” on page 20.

Before you begin the installation of Change Manager software, see “Change Manager Server Requirements” on page 26 to understand the hardware and software requirements for the Change Manager server.

Overview

The data maintained and used by Change Manager exist in several places:

- The Change Manager file repository contains copies of all managed files, Flash archives, boot media, and so on. The repository is created and configured using the Change Manager installation tools. It is managed using the usual Solaris file system tools.
- The Sun Management Center topology contains data about managed systems and groups of systems. Change Manager operates on data contained in the topology. Sun Management Center can also operate on the same data. The topology is created and managed using Sun Management Center tools.
- Additional information, or “metadata,” about objects in the file repository and in the topology is maintained in the Change Manager database tables, which share a schema in the Oracle database underlying Sun Management Center. The metadata tables are created and managed using the Change Manager installation tools.
- Unique Change Manager configuration data files, some that a user can edit.

Managed Data Objects

Change Manager File Repository

The Change Manager file repository is where Change Manager keeps all the file objects (such as Flash archives, Boot images, Manifests, Reports), Jumpstart configuration files, and other private data used by Change Manager software.

You must specify the location of the file repository when you configure Change Manager. The `cmsetup(1MCM)` script asks you for the location of a directory under which Change Manager can create the file repository. The required disk space depends on the number of Flash archives, Solaris boot images, audit manifests, and other software. You must decide how much file system space you want to allocate for the storage of the Change Manager file repository.

Sun Management Center Topology

Sun Management Center maintains information about managed hosts and host groups in its topology database. Change Manager operates on the topology, adding and removing entries that correspond to managed hosts. The Sun Management Center

console presents a graphical view of the topology, while Change Manager presents a tabular view of the same data. Change Manager also maintains additional Change Manager-specific data about topology objects in its Metadata tables.

None of the Change Manager management utilities (`cminst(1MCM)`, `cmsetup(1MCM)`, `cmuninst(1MCM)`) have any effect on the topology data. These utilities are maintained by Sun Management Center and are managed with the usual Sun Management Center tools.

Change Manager Database Tables

Change Manager maintains additional metadata about topology objects and files in the repository. These metadata are kept in Oracle database tables. These tables contain information about all Change Manager managed objects (for example, flash archives, boot images, and host configuration data).

During configuration, the `cmsetup` script asks the user for the location of the directory under which these database table files are to be created. The required disk space is about 0.5 Gbytes. These files are created strictly for the use of Oracle and require no user management.

Configuration Data

Various Change Manager operational parameters are maintained in files that are located in the Sun Management Center configuration directory `/var/opt/SUNWsymon/cfg`. These files are created when you install and set up Change Manager. In ordinary use, no user modifications to the configuration data are required. If necessary, however, you can modify the `ichange.cfg` file, as described in `ichange.cfg(4CM)`.

Setting Up Change Manager

Initialization

When you use `cminst` to install the Change Manager software, you are asked whether the Change Manager data is to be configured. If setup is requested, the metadata table files, file repository structure, and required Change Manager configuration files are all created. If you elect not to configure the Change Manager data during installation, the `cmsetup` script must be run before Change Manager functionality is available.

Once the Change Manager data elements have been configured, you can run `cmsetup` at any time to reinitialize or remove Change Manager data. Reinitializing resets the metadata tables to factory settings and optionally removes Change Manager data. Reinitializing without removing data leaves the repository data files in place, but clears all Change Manager metadata. In either case, Change Manager remains functional and is still available after the operation is completed.

Uninstallation

The `cmuninst` command removes all Change Manager components and, optionally, data. If you elect not to remove Change Manager data, the contents of the file repository and Change Manager metadata tables are left in place. A subsequent reinstallation of Change Manager thus finds the existing data and, if you choose, uses this data rather than reinitializing the data.

To remove Change Manager data without removing the underlying Change Manager software components, use `cmsetup` as described previously.

Removing or initializing Change Manager data does not affect the topology, which is maintained by Sun Management Center.

Backup and Restore

Backup of Change Manager data involves both Change Manager database tables and the Change Manager file repository. You can back up the Change Manager database files by using the Sun Management Center command `es-backup`. The `es-backup` command backs up both Sun Management Center database files and Change Manager database files, including all Change Manager configuration data kept under `/var/opt/SUNWsymon/cfg`. The `es-restore` command restores data backed up by `es-backup`. For more information about `es-backup` and `es-restore`, see the Sun Management Center user documentation.

You can back up the Change Manager file repository by using ordinary Solaris operating environment file system tools. You must restore the repository after you run `es-restore` to restore Change Manager and Sun Management Center metadata.

Installing and Configuring the Change Manager Server (Task Map)

The following table identifies the procedures related to the installation and configuration of the Change Manager server.

Task	Description	For Instructions
(Optional) Install the Sun Management Center 3.0 Performance Reporting Manager.	Install and configure the Sun Management Center 3.0 Performance Reporting Manager before installing Change Manager.	See <i>Sun Management Center 3.0 Performance Reporting Manager User's Guide</i> .
Install the Sun Management Center 3.0 server software on the Change Manager Server.	Install the Sun Management Center 3.0 Update 4, Patch 6 (or later) server software on the Change Manager server.	See "How to Install Sun Management Center 3.0 Update 4 Server Software on the Change Manager Server" on page 35 and "How to Install the Sun Management Center 3.0 Jumbo Patch for Solaris 8 and Solaris 9 on the Change Manager Server" on page 39. If Sun Management Center is already installed, ensure that the appropriate packages are installed. See "Change Manager Server Requirements" on page 26. Also see the <i>Sun Management Center 3.0 Software Installation Guide</i> .
Install the Change Manager 1.0 server software on the Change Manager server.	Install the Change Manager 1.0 server software on the Change Manager server.	See "How to Install Change Manager Server Software on the Change Manager Server" on page 40.

Task	Description	For Instructions
(Optional) Disable SMNP agent to free port 161 for Sun Management Center.	Disable the SNMP agent to avoid the conflict on port 161 with Sun Management Center.	See "How to Disable the SNMP Daemon to Avoid Port 161 Conflict" on page 42.
(Optional) Start the web server on the Change Manager server.	Start the web server on the Change Manager server so you can access the browser interface.	See "How to Start the Web Server on the Change Manager Server" on page 42.
(Optional) Uninstall the Change Manager server software.	Uninstall the Change Manager software on the Change Manager server.	See "How to Uninstall Change Manager Server Software From the Change Manager Server" on page 42.
(Optional) Reinstall the Change Manager server software.	Reinstall the Change Manager software on the Change Manager server.	See "How to Reinstall Change Manager Server Software on the Change Manager Server" on page 43.
(Optional) Regenerate the security keys.	Regenerate the security keys by changing the seed on the Change Manager server and each managed host controlled by that server.	See "How to Regenerate the Security Keys by Changing the Seed" on page 44.
Authorize users to access Change Manager.	Create a special user to act as the Sun Management Center administrator. The Sun Management Center 3.0 installation scripts ask for you to specify a user to be the administrator. By default, specify <code>root</code> . The installation scripts give the specified user the appropriate permissions. Give users the appropriate permissions for accessing Change Manager by creating Sun Management Center users.	See "Authorizing Users to Access Change Manager" on page 45.
Access the Change Manager server.	Use the browser interface or the command-line interface to access the Change Manager server to perform Change Manager tasks.	See "Accessing the Change Manager Server by Using the Browser Interface" on page 46 or "Accessing the Change Manager Server by Using the Command-Line Interface" on page 49.

Installing and Configuring the Change Manager Server

Note – To use the Sun Management Center 3.0 Performance Reporting Manager (PRM) with Change Manager, first install Sun Management Center 3.0 PRM. Installing and configuring PRM is described in the *Sun Management Center 3.0 Performance Reporting Manager User's Guide*.

To create a Change Manager server, you must first install Sun Management Center 3.0 Update 4 server software. Then, you must install the Change Manager 1.0 server software.

Note – The following procedures describe how to install the Sun Management Center software and add-on packages that are required by Change Manager.

▼ How to Install Sun Management Center 3.0 Update 4 Server Software on the Change Manager Server

Before you begin the installation of Change Manager software, see “Change Manager Server Requirements” on page 26 to understand the hardware and software requirements for the Change Manager server.

Installing the Sun Management Center server software also installs the Sun Management Center agents.

The following procedure describes the steps for performing the installation from a CD. To perform web installations of the Sun Management Center software, see “To Install the Sun Management Center Packages From the Web in a Solaris Environment” in *Sun Management Center 3.0 Software Installation Guide*.

Note – These instructions describe how to install the Sun Management Center software and add-on packages that are required by Change Manager.

See “Installing the Sun Management Center 3.0 Software” in the *Sun Management Center 3.0 Software Installation Guide* for instructions on installing Sun Management Center software.

1. Become superuser.
2. Set the `JAVA_HOME` environment variable.

```
# JAVA_HOME=/usr/java export JAVA_HOME
```
3. Disable the SNMP agent to avoid agent port conflict with the Sun Management Center agent.
See “How to Disable the SNMP Daemon to Avoid Port 161 Conflict” on page 42.
4. Insert the Sun Management Center 3.0 1 of 3 CD into the CD-ROM drive.



Caution – Do not be in the `/cdrom/cdrom0/sbin` directory or in any directory on the CD when you run the `es-inst` command. Running the command in this way causes problems when changing to subsequent Sun Management Center 3.0 CDs, as you cannot unmount an active CD.

5. Run the `/cdrom/cdrom0/sbin/es-inst` command to install the Sun Management Center software.

```
# /cdrom/cdrom0/sbin/es-inst
```
6. Specify the target directory.
By default, the target directory is `/opt`. To accept the default, press Return.
7. Install the production environment by typing `1` at the prompt.
8. Install the components of the Server Layer.
 - a. Type `y` at the Server Layer prompt.
 - b. Type `n` at the Agent Layer prompt and the Console Layer prompt.

Note – Installing the Server Layer also installs the Agent Layer.

The Agent Layer and Console Layer are not required by Change Manager. However, if you type `y` to install these layers, the layers are installed.

If you plan to use the Change Manager server as a fully functional Sun Management Center server, you must install the agent and console components.

If the amount of disk space available in `/var/opt/SUNWsyman` is insufficient, you are asked to specify a directory name that has sufficient disk space. Supply the name of a directory in a disk slice that has at least 770 Mbytes of free disk space. Packages are installed.

9. **Install the Premier Management Applications, the add-on products, and the platform support add-ons.**
 - a. **Type y at the Advanced System Monitoring prompt if you want to install it.**
Type n if you do not want to install it.
This product is not required for Change Manager.
 - b. **Type y at the Premier Management Applications prompt.**
This product is required for Change Manager.
 - c. **Type y at any other add-on product prompts to install them.**
Type n if you do not want to install the products.
None of these add-on products are required for Change Manager.
 - d. **Type y at the platform support prompt that matches the hardware of your Change Manager server.**
This product is required for Change Manager.
 - e. **Type y at any other platform support prompts to install support for other hardware.**
Type n if you do not want to install the products.
None of these add-on products are required for Change Manager unless the platform package matches your server type.
10. **Press Return at the Premier Management Applications Product license prompt.**

Note – You might require product licenses for any add-on products you install to enable them.

11. **When prompted, insert the Sun Management Center 3.0 2 of 3 CD into the CD-ROM drive, and press Return.**
Packages are installed.
12. **Install the platform package for this system.**
For example, if your system is a Netra™, install the Netra platform package.
13. **When prompted, insert the Sun Management Center 3.0 3 of 3 CD into the CD-ROM drive, and press Return.**
Packages are installed.
14. **When all the packages are installed, run the setup by typing y at the prompt.**
15. **When asked about updating the `/etc/system` file with changes required to support the Sun Management Center database, type y.**

- a. **Determine whether you need to install the Sun Management Center 3.0 Update 4 patch that supports Change Manager.**

Change Manager requires patch 110938-06 or later.

- If Sun Management Center 3.0 Update 4 Patch 6 (110938-06) or later is already installed, type `y` at the prompt to run the setup program.
- If Sun Management Center 3.0 Update 4 Patch 6 (or later) is not installed, type `n` at the prompt to exit the setup program. To install the patch, see “How to Install the Sun Management Center 3.0 Jumbo Patch for Solaris 8 and Solaris 9 on the Change Manager Server” on page 39.

- b. **Reboot the system for the changes to `/etc/system` to take effect.**

```
# reboot
```

- c. **After the system boots, log in as superuser.**

- d. **Run the `es-setup` command.**

```
# /opt/SUNWsymon/sbin/es-setup
```

16. **Create an *agent seed* to generate keys.**

Note – Use the same seed for all the machines you install. Keep a record of this seed for future use.

For instructions on changing the seed, see “How to Regenerate the Security Keys by Changing the Seed” on page 44.

- a. **Type the seed at the first prompt.**

The seed you type is not echoed to the display.

- b. **Type the seed at the second prompt to confirm your choice.**

This part of the setup generates security keys that are used for communicating between processes. A seed must be provided to initialize the keys.

17. **Designate a user to be the Sun Management Center administrator by typing `root` at the prompt.**

18. **Specify the base URL to Sun Management Center help.**

Please enter base URL to Sun Management Center help [local]:

Press Return to use `local` as the location for the help.

19. **Determine whether to set up the Sun Fire™ (6800/4810/4800/3800) platform administration module.**

- If you do not need this module, type `n`.

- If you need this module to support your platform, type `y` and provide the requested information.
- 20. **(Optional) If `es-setup` detects that agent port 161 is already in use by SNMP, specify a different port number for the agent by doing the following:**
 - a. Type `y` at the prompt.
 - b. Type a port number from 1100 to 65535 at the prompt (for example, 1161).
You can disable SNMP and rerun the setup. See “How to Disable the SNMP Daemon to Avoid Port 161 Conflict” on page 42.
- 21. **After the setup is performed for the platform packages you installed, wait for the Sun Management Center database setup to complete.**
This step might take 15 to 20 minutes.



Caution – Avoid interrupting the database setup procedure. Interrupting this procedure might leave the Oracle database in an inconsistent state. When left in such a state, you might need to reboot the system.

- 22. **Start the Sun Management Center agent and server components by typing `y` the prompt.**

▼ How to Install the Sun Management Center 3.0 Jumbo Patch for Solaris 8 and Solaris 9 on the Change Manager Server

The Change Manager software requires that you install version 6 (or later) of the Sun Management Center 3.0 Update 4 software. The Sun Management Center 3.0 Update 4 CDs include version 5 of the patch.

1. **Download the latest version of patch 110938 from the SunSolve Web site (<http://sunsolve.Sun.COM>). As of the release of Change Manager 1.0, version 8 of the patch is available on the SunSolve Web site.**
 - a. Click Patch Finder.
 - b. Type 110938-08 in the field and click Find Patch.
 - c. Click HTTP to download the patch.
2. **Become superuser.**
3. **Change to the directory where you downloaded the patch.**

The downloaded patch is a ZIP archive file.

4. Use **unzip** to remove the patch files from the ZIP archive.

```
# unzip 110938-08.zip
...
```

The patch directory is in the same directory as the ZIP archive file.

5. Add patch 110938-08 to the server.

```
# patchadd 110938-08
...
```

6. Start the `/opt/SUNWsymon/sbin/es-setup` script to complete the server setup.

▼ How to Install Change Manager Server Software on the Change Manager Server

Before you begin the installation of Change Manager software, see “Change Manager Server Requirements” on page 26 to understand the hardware and software requirements for the Change Manager server.

Installing the Change Manager server software also installs the agents.

1. Become superuser.
2. Go to the Change Manager download web site.
3. Choose a directory in which to extract the Change Manager software product, and download the Sun Management Center Change Manager 1.0 tar file to that directory.
4. Extract the Change Manager software from the tar file:

```
# tar xvf sunmccm1_0.tar
...
```

5. To install Change Manager, type:

```
# ./disk1/sbin/cminst
```

The `cminst` command installs the Change Manager server and agent packages when it determines that the Sun Management Center server and agent software have been installed on the Change Manager server. See the `cminst(1MCM)` man page.

If the appropriate software has not already been installed, you might see the following error messages:

- If you have not first run the Sun Management Center `es-setup` command before running `cminst`, the following error message appears:

```
The system requires the user to run es-setup before installing the
Change Manager addon. Please run /opt/SUNWsymon/sbin/es-setup to
```


setup up the SunMC database before running `cminst`.

- If the Solaris Live Upgrade packages have not been installed on your Solaris 8 server before you run `cminst`, the following error message appears:

```
Change Manager requires packages SUNWluu SUNWlur
Please install the these packages before adding
Change Manager to your system.
```

- If the Solaris Live Upgrade packages have not been installed on your Solaris 9 server before you run `cminst`, the following error message appears:

```
Change Manager requires packages SUNWnfscu SUNWnfscr SUNWluu
SUNWlur. Please install the these packages before adding
Change Manager to your system.
```

6. Type `y` to set up the Change Manager database.

7. When the Change Manager database is configured, type `/var/opt` at the prompt to specify the directory in which to store the database.

Type `y` to create the directory if it does not already exist.



Caution – The Change Manager database and repository *must* be stored on a local disk of the Change Manager server.

8. Create a seed to generate keys.

Use the same seed that you specified in Step 16 of “How to Install Sun Management Center 3.0 Update 4 Server Software on the Change Manager Server” on page 35.

9. Specify the directory in which to create Change Manager files.

By default, the directory is `/var/opt`. Press Return to accept the default.

10. Specify whether to restart the Sun Management Center server.

Type `y` to restart the server.

If you do not want to restart the server, type `n`.

Installing and Configuring the Change Manager Server (Optional Tasks)

▼ How to Disable the SNMP Daemon to Avoid Port 161 Conflict

The Sun Management Center agent and the `snmpdx` agent both try to use port 161. To use port 161 for Sun Management Center agents, disable `snmpdx`.

1. **Become superuser.**
2. **Stop `snmpdx`.**

```
# /etc/init.d/init.snmpdx stop
```
3. **Prevent `snmpdx` from running in future.**

```
# cd /etc/snmp/conf  
# mv snmpdx.rsrc snmpdx.rsrc.stop
```

▼ How to Start the Web Server on the Change Manager Server

The web server should start automatically. Should you need to start the web server manually, follow this procedure.

1. **Become superuser.**
2. **Start the web server.**

```
# /usr/sadm/bin/smcwebserver start
```

Now, you can access the Change Manager browser interface. For details, see “How to Log In to the Change Manager Server (Web Browser)” on page 46.

▼ How to Uninstall Change Manager Server Software From the Change Manager Server

The `cmuninst` command uninstalls the Sun Management Center Web Console packages and the Change Manager server and agent packages. The Change Manager database and Change Manager repository are not removed.

1. **Become superuser.**
2. **Go to the directory where you extracted the Change Manager 1.0 product tar file.**
3. **Uninstall the Change Manager database and software by typing:**

```
# ./disk1/sbin/cmunist
```

 See the `cmunist(1MCM)` man page for details.
4. **Determine whether you want to preserve the Change Manager database.**
 - If you type `n`, the database is removed.
 - If you type `y`, the database is preserved.
5. **Determine whether you want to remove the Change Manager server software.**
 - If you type `y`, the packages are removed.
 - If you type `n`, the packages are preserved.
6. **Determine whether you want to restart the Sun Management Center agent and server components.**
 - If you type `y`, the server is restarted and `cmunist` exits.
 - If you type `n`, `cmunist` exits.

▼ How to Reinstall Change Manager Server Software on the Change Manager Server

To reinstall the Change Manager server software, you must have already run the `cmunist` command. See “How to Uninstall Change Manager Server Software From the Change Manager Server” on page 42.

Reinstalling the Change Manager server software also reinstalls the agents.

1. **Become superuser.**
2. **Insert the Sun Management Center Change Manager 1.0 CD into the CD-ROM drive.**
3. **Run the `/cdrom/cdrom0/sbin/cmunist` command to install the Sun Management Center Change Manager server software.**

```
# /cdrom/cdrom0/sbin/cmunist
```

 See the `cmunist(1MCM)` man page.
4. **`cmunist` finds an existing Change Manager database and repository.**
 - If you want to continue to use the Change Manager data, type `n`.
 - If you want to restore the database to factory settings and discard the existing Change Manager data, type `y`.

You are asked to give the name of the directory that contains the database and repository.

Be sure that the directory has at least 500 Mbytes of available disk space.

▼ How to Regenerate the Security Keys by Changing the Seed

You might want to change the security keys periodically or change the security keys when they have been compromised. See the *Sun Management Center 3.0 Software User's Guide* for more information.

This process requires you to make manual changes on the Change Manager server and on each managed host controlled by that server.

1. Choose a new seed.

2. Update the seed on the Change Manager server.

- a. Become superuser on the Change Manager server.

- b. Set the new seed:

```
# /opt/SUNWsymon/sbin/es_run base-usm-seed.sh -s new_seed -u public
```

- c. Update the value of agentseed in the

/var/opt/SUNWsymon/cfg/ichange.cfg file to match the new seed.

- d. Restart the Sun Management Center server on the Change Manager server:

```
# /opt/SUNWsymon/sbin/es-restart -A
```

3. Update the seed on each managed host.

- a. Become superuser on the managed host.

- b. Set the new seed:

```
# /opt/SUNWsymon/sbin/es_run base-usm-seed.sh -s new_seed -c agent -u public
```

- c. Restart the Sun Management Center agent on the managed host:

```
# /opt/SUNWsymon/sbin/es-restart -A
```

Configuring the Change Manager Server by Using the `ichange.cfg` File

You can change the behavior of the Change Manager application by modifying certain runtime parameters. These parameters are stored in the application configuration file, `ichange.cfg`. The configuration file is located in the `/var/opt/SUNWsymon/cfg` directory.

Note – When you make changes to the `ichange.cfg` file, you must restart the Sun Management Center services before the changes can take effect.

Restart the Sun Management Center services by running the following command as superuser:

```
# /opt/SUNWsymon/sbin/es-restart -S
```

For information about the parameters described by the `ichange.cfg` file, see `ichange.cfg(4CM)`.

Authorizing Users to Access Change Manager

To perform Change Manager operations, you must be an authorized user of the Sun Management Center application. In addition, you must have certain permissions to perform particular tasks.

▼ How to Add Sun Management Center Change Manager Users

When adding users to the Change Manager server, give them the general, administrator, and domain administrator permissions.

1. **Become superuser on the Change Manager server.**
2. **Add the names of the users, one valid UNIX® user name per line, to the `/var/opt/SUNWsymon/cfg/esusers` file.**

```
# tail /var/opt/SUNWsymon/cfg/esusers
esmaster
espublic
root
pat
suzi
chris
#
```

3. Add the names of users to the `esadm` and `esdomain` stanzas in the `/etc/group` file, separating each user name with a comma.

```
esadm: :1000:root,pat,suzi,chris
esdomain: :1001:root,pat,suzi,chris
```

To delete users or user permissions, remove the user names from these files.

Related Information

For more information, see “Users and Security” in *Sun Management Center 3.0 Configuration and Deployment Guide*. This section describes the users, user groups, and roles that you can create. The section also describes how to control user access.

Also, see “Sun Management Center Security” in *Sun Management Center 3.0 Software User’s Guide* for information about users and access control.

Accessing the Change Manager Server by Using the Browser Interface

To use the Change Manager browser interface, you need to access the Change Manager server with a web browser as an authenticated user. Therefore, you must log in to the browser application. The following procedures show how to access and log in to the browser interface, and how to get help.

▼ How to Log In to the Change Manager Server (Web Browser)

The browser user interface for the Change Manager supports the following web browsers:

- Netscape™ Communicator, version 4.7x for Solaris 8 and Solaris 9

- Netscape Communicator, version 4.7x for Microsoft Windows
- Microsoft Internet Explorer, version 5.x for Microsoft Windows

The Change Manager *URL* follows this form:

`https://server_name.domain:6789/changemgr`

Before beginning, make sure that you have a Sun Management Center user account. You can always log in as the Sun Management Center administrator (`root`) that you set up during installation.

1. Go to the Change Manager web site, for example:

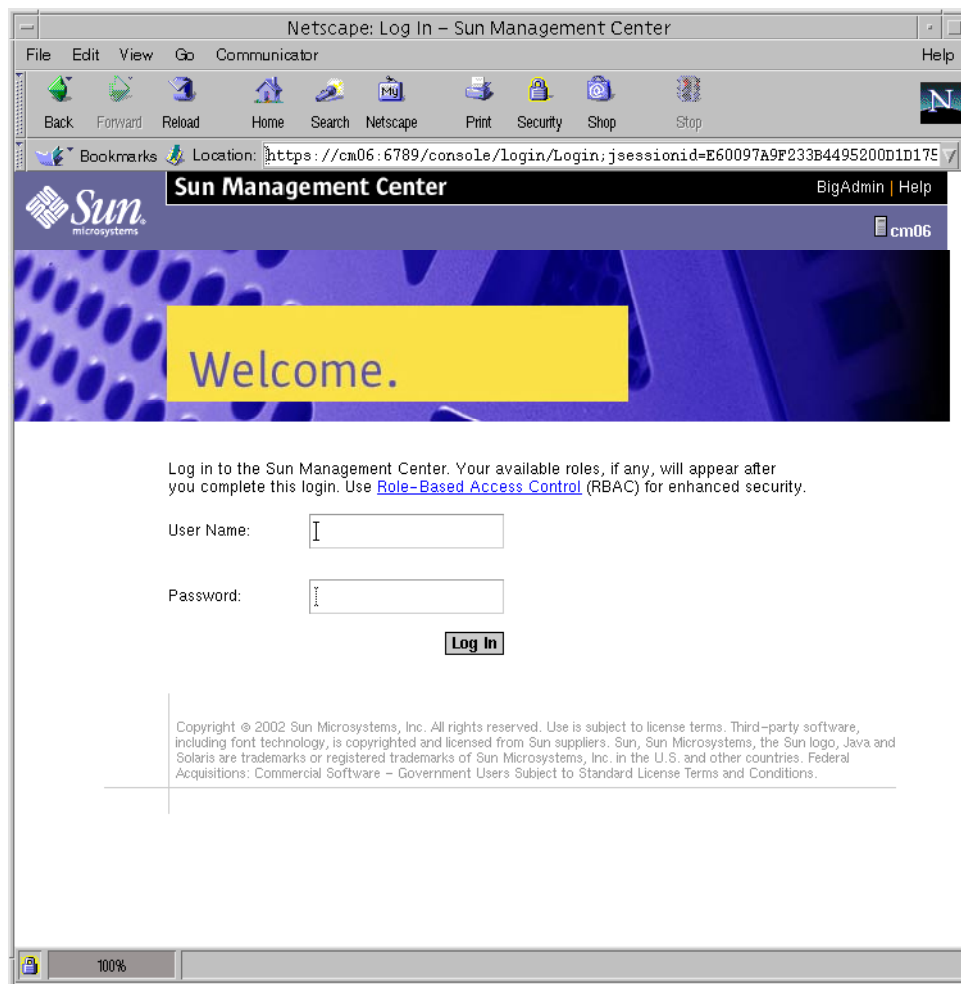
`https://testserver.yourcompany.com:6789/changemgr`

This URL accesses the Change Manager site on the `testserver.yourcompany.com` Change Manager server.

2. When a dialog box asks for you to accept a certificate for the new site, accept it.

Follow the instructions on the dialog boxes.

The login page for Change Manager appears.



3. Type your user name.

4. Type your password.

5. Click Log In.

A page that lists all registered web applications appears.

6. Click Change Manager to open the browser interface.

Your browser console session times out after 15 minutes of inactivity. To change the timeout value for the browser console session, see "How to Change the Timeout Value for the Browser Console Session" on page 49.

▼ How to Change the Timeout Value for the Browser Console Session

Your browser console session logs out after *timeout* minutes. The default value for *timeout* is 15 minutes.

1. **Decide how long, in minutes, to make the timeout.**
2. **Update the value of `<session-timeout>` in the `/usr/sadm/lib/webconsole/conf/web.xml` file.**
The format is `<session-timeout>timeout</session-timeout>`. *timeout* represents the session timeout in minutes.
3. **Restart the web server for the new time-out value to take effect.**

```
# /usr/sadm/bin/smcwebserver restart
```

▼ How to Get Help (Web Browser)

1. **Locate the general links area at the top of the web page.**
2. **Click Help in the section with the black background.**
A new web browser window opens to the Change Manager help document.

▼ How to Get Glossary Definitions (Web Browser)

1. **Locate the general links area at the top of the web page.**
2. **Click Help in the section with the black background.**
A new web browser window opens to the Change Manager glossary.
3. **Click Help Glossary at the top of the help web page.**

Accessing the Change Manager Server by Using the Command-Line Interface

To use the command-line interface of Change Manager, you need to access the Change Manager server as an authenticated user. Therefore, you must log in to the Change Manager server. The following procedures show you how to use the command-line interface to perform authorized Change Manager operations. See the `changemgr(1MCM)` man page.

▼ How to Initiate a Change Manager Session (Command Line)

The `changemgr` command is in the `/opt/SUNWichange/bin` directory, so add this directory to your search path (`$PATH` environment variable).

● Start a Change Manager session.

```
$ changemgr session [ -u username ] [ -p file ] [ -d domain ] \  
[ command [ command-arguments ] ]
```

<code>-u <i>username</i></code>	Specify the user name to authenticate. If this option is not specified, the user is the current UNIX user.
<code>-p <i>file</i></code>	<i>file</i> consists of a single line, which contains the password. If <i>file</i> is <code>-</code> , then the user can supply the password as standard input. If the <code>-p</code> option is not supplied, then the <code>changemgr</code> command prompts the user for his password.
<code>-d <i>domain</i></code>	Specify the administrative domain on which to operate. In the context of a session, the default is the domain specified for the session. If no domain is specified, <i>domain</i> is the user's home domain. By default, <i>domain</i> is the user's home domain.
<i>command</i>	Normally, <i>command</i> is a <code>ksh</code> or <code>sh</code> script that contains Change Manager commands in the form of the command-line interface. If <i>command</i> is one of the <code>ksh</code> or the <code>sh</code> shells, you get an interactive session.
<i>command-arguments</i>	Specifies the optional arguments to <i>command</i> .

Example—Initiating an Interactive Change Manager Session

The following command line initiates an interactive Change Manager session that uses the `ksh` command. The session is an authenticated subshell.

```
$ changemgr session ksh
```

Example—Initiating an Interactive Session by Using the Default Shell

The following command line initiates an interactive Change Manager session that uses the value of `$SHELL` to determine which shell to use. Since the value of `$SHELL` is `/bin/ksh`, then `ksh` is used. The session is an authenticated subshell.

```
$ changemgr session
```

Example—Running Commands in an Interactive Change Manager Session

The following example shows an interactive Change Manager session. The `changemgr session` command starts a subshell in which you can run authenticated `changemgr` commands.

Suzi uses the command-line interface to purge a completed job from the job queue. This job, `IC_1`, was initiated from the browser interface. When Suzi is done with these tasks, she exits the session by typing `exit` at the subshell prompt.

```
$ changemgr session
Password: Suzi's password
$ changemgr jobs -l IC_1
IC_1      succeeded
$ changemgr ack IC_1
$ changemgr jobs -l IC_1
$ exit
```

Example—Running Scripts in a Change Manager Session

This example shows how to use the `changemgr session` command to run a script. The command line runs the script called `deploy-web`, which contains the following:

```
#!/bin/sh
changemgr import "$1" /web-server
changemgr fileset -s MediaName=s9.miniroot "$1"
changemgr hostset -s base_config_flar_archive="/$1" "$2"
changemgr update "$2"
```

The following command line runs the `deploy-web` script.

```
$ changemgr session deploy-web web.flar host1
```

▼ How to Authenticate a User (Command Line)

1. Authenticate the user for any one of the `changemgr` commands.

You can run the `changemgr help` commands as an unauthenticated user.

2. To control user authentication, use the `-u username` option with the `-p file` option.

- If the `-u` option is not specified, then the user is the current UNIX user. In this case, you can supply a file with your password to the `-p` option.
- If the `-p` option is not specified, then the user is prompted for his password.

Example—Using Default User Authentication With No Password File

Suzi creates a folder as herself. She does not specify a file with her password in it.

```
$ changemgr mkdir /web-server/apache
Password: Suzi's password
$
```

Example—Using Default User Authentication With a Password File

Suzi creates a folder as herself. She specifies a file with her password in it to authenticate.

```
$ changemgr mkdir -p .pfile /web-server/apache
```

Example—Authenticating Another User

Suzi creates a folder as `root`.

```
$ changemgr mkdir -u root /web-server/apache
Password: root password
$
```

Creating a Deployable Solaris Flash Archive (Tasks)

This chapter describes how to create customizable Solaris Flash archives. Such archives are suitable for deployment by Change Manager.

The following topics are covered in this chapter:

- “Creating Software Stacks” on page 53
- “Installing the Sun Management Center and Change Manager Agents on a Master System (Task Map)” on page 56
- “Installing the Sun Management Center and Change Manager Agents on a Master System” on page 57
- “Unconfiguring Software Applications” on page 59
- “Creating the Solaris Flash Archive From the Master System” on page 60
- “Creating a Customizable Solaris Flash Archive” on page 61

Creating Software Stacks

The term *hardware and software integration* encompasses the combined tasks of installing and configuring a system. Integration means several things:

- Installing and configuring a software product correctly
- Binding the software product to a hardware platform
- Ensuring that several software products correctly function and interoperate with each other

The result of integrating several software products is referred to as an *integrated software stack* or simply a *software stack*.

Change Manager imports, manages, and deploys software stacks that are stored as *Solaris Flash archives*. Change Manager deploys these archives to managed hosts. The per-client customization is achieved through the use of archive parameters and custom JumpStart finish scripts that are included in the Solaris Flash archive.

The system that is used as the prototype from which the software stack is created is called the *master system* or reference system.

The following sections describe how to create software stacks on master systems.

Note – Do *not* create a Solaris Flash archive on a master system that is a Sun Management Center server or a Change Manager server. Sun Management Center cannot be deployed by using the Solaris Flash technology.

Choosing the Master System

Before you begin the installation of Change Manager software, see “Master System Requirements” on page 27 to understand the hardware and software requirements for the master system.

A master system is the prototype for other systems that will run the software staged on this master. Therefore, choose a master system that closely matches the hardware configurations of the managed hosts it represents. Ideally, you stage the software on an identical system to avoid software discrepancies caused by hardware differences (such as missing device drivers). However, choosing a master system that is similar to the managed hosts is sufficient.

You can create a Solaris Flash archive on one platform that is deployable to a range of other similar platforms. For version 1.0 of Change Manager, this range is restricted to platforms that use the same Sun Management Center agent module. These agents can only be installed on the platform type for which they are intended. For instance, you *cannot* install a Netra agent module on a Sun Enterprise™ 4500 system. Therefore, an archive created on the Sun Enterprise 4500 system cannot provide full functionality on a Netra system.

Current Sun Management Center agent modules are:

- Desktop (Sun Blade™ 100, Sun Blade 1000, Ultra 1, Ultra 10, Ultra 2, Ultra 30, Ultra 450, Ultra 5, Ultra 60, Ultra 80)
- Netra (T1, T4, T/112x, X1)
- Workgroup Enterprise Server (220, 250, 420, 450, 280, 480, 880, 10, 150, 2)
- Sun Enterprise 3000-6500 Servers
- Sun Fire (3800, 4800, 4810, 6800)
- Sun Fire 15000

You must also consider hardware architecture when choosing a master system. Hardware independence is restricted by both instruction set and platform architecture. The master system and the managed hosts must have the same instruction set (namely, SPARC[®]) and platform architecture (namely, sun4u). Note that SPARC is the only processor type that Change Manager currently supports. Also note that all current SPARC products are sun4u.

If you plan to deploy the Solaris Flash archive to a range of platforms, or if the identical hardware is unavailable, ensure that all software that is required to support the various hardware configurations is installed on the master system. This software must be installed on the master system before you create the Solaris Flash archive. For more information, see “Addressing Hardware Differences Between a Master System and Managed Hosts” on page 55.

Installing Software on the Master System

Begin to create the software stack by installing software on the master system. First, install the Solaris operating environment and Solaris patches on the master system. Then, install the other software applications you want.

Note – Not all software applications can be deployed by using Solaris Flash technology. For example, Sun Management Center software retains instance-specific configuration information that cannot be unconfigured for redeployment. See the *Solaris 9 Installation Guide* for information about the limitations of this technology with respect to add-on software applications.

Addressing Hardware Differences Between a Master System and Managed Hosts

The master system might not match the hardware configuration of the other systems on which the Solaris Flash archive might be deployed. In such cases, ensure that the master system includes software to support all hardware. To support all hardware, install the Entire Distribution plus OEM Support package cluster (SUNWCXa11) on the master system. You must also install any third-party drivers or specialized device drivers on the master system.

For example, you select a PCI-based master system to create software stacks. Driver software for other buses, such as SBUS, are not installed by default if a package cluster other than SUNWCXa11 is installed. Consequently, software stacks you build on this master system will not have the SBUS drivers available. As a result, managed hosts that have SBUS hardware will not have the appropriate software available to support the hardware.

To avoid this situation, do one or more of the following:

- Choose a master system that is identical or almost identical to the managed hosts.
- Include all possible Solaris driver software on the master system by installing all of the Solaris software.
- Select the required hardware support while installing Solaris software. Use either the custom JumpStart package add keywords or use the interactive installer's package customization feature.
- Add any missing software to the master system by using a custom JumpStart finish script after Solaris software is installed.

Installing the Sun Management Center and Change Manager Agents on a Master System (Task Map)

The next step in creating a deployable and manageable Solaris Flash archive is to install the Sun Management Center and Change Manager agents on the master system. These agents enable communication between the Change Manager server and the managed hosts running the software stack you are now building. The agents are installed on the master system and incorporated into the Solaris Flash archive.

Note – These procedures assume that you already have a Change Manager server installed and configured. See Chapter 3.

The following table identifies the tasks for installing the Sun Management Center and Change Manager agents on the master system. Perform the tasks in the order shown.

Task	Description	For Instructions
1. Install the Sun Management Center 3.0 agent software on a master system.	Install the Sun Management Center 3.0 Update 4, Patch 6 agent software on the master system you use to create a Solaris Flash archive.	See “How to Install Sun Management Center 3.0 Update 4 Agent Software” on page 57. If Sun Management Center is already installed, ensure that the appropriate packages are installed. See “Change Manager Server Requirements” on page 26. Also see the <i>Sun Management Center 3.0 Software Installation Guide</i> .
2. Install the Change Manager 1.0 agent software on a master system.	Install the Sun Management Center Change Manager 1.0 agent software on the master system you use to create a Solaris Flash archive.	See “How to Install Change Manager Agent Software” on page 59.

Installing the Sun Management Center and Change Manager Agents on a Master System

Prior to creating a Solaris Flash archive on the master system, you must first install Sun Management Center 3.0 Update 4 agent software. Then, you must install the Change Manager 1.0 agent software.

▼ How to Install Sun Management Center 3.0 Update 4 Agent Software

Before you begin the installation of Change Manager software, see “Master System Requirements” on page 27 to understand the hardware and software requirements for the master system.



Caution – The Sun Management Center platform add-ons you install on the master system become part of the Solaris Flash archive. However, *only* the Advanced Monitoring, Advanced Services, System Management, and Change Manager add-ons are configured on managed hosts you install using this archive.

This procedure is very similar to the one used to install Sun Management Center on the Change Manager server. This procedure describes the different steps that result in the installation of only the Sun Management Center agent.

1. **Become superuser.**
2. **Run the `/cdrom/cdrom0/sbin/es-inst` command.**
3. **Specify which of the three layers to install.**
 - a. Type `n` at the **Server Layer** prompt and at the **Console Layer** prompt.
 - b. Type `y` at the **Agent Layer** prompt to install it.
 - c. Type `n` for all other add-on modules, including the **Premier Management Applications add-on**, *except for the add-on for the platform type of the master system (Desktop, Netra, WGS, and so on).*

You are only given the opportunity to install agent platform support for the platform type of the master system.

4. **Specify the agent seed to use.**

Please enter the seed to generate keys:

At this prompt, specify the same seed you used to install the Change Manager server.

Note that this step is important only if you want the master system to be managed by the Change Manager server. When the Solaris Flash archive created from this master system is deployed, the seed is discarded in favor of the seed that was used to install the Change Manager server deploying the archive.

5. **Specify the host name of the Sun Management Center server.**

Please enter the Sun Management Center Server Hostname:

This step is only important if you want the master system to be managed by the Change Manager server. When the Solaris Flash archive created from this master system is deployed, the host name is discarded in favor of the actual host name of the Change Manager server deploying the archive.

6. **Install Sun Management Center 3.0 Update 4 Patch 6 on the Change Manager server by typing `n` at the following prompt:**

Sun Management Center setup complete.

Do you want to start Sun Management Center agent now [y|n|q]

When the installation procedure completes, you *must* ensure that patch 110938-06, or later, is installed on the master system. See “How to Install the Sun Management Center 3.0 Jumbo Patch for Solaris 8 and Solaris 9 on the Change Manager Server” on page 39.

▼ How to Install Change Manager Agent Software

1. **Become superuser.**

2. **Run the `/cdrom/cdrom0/sbin/cminst` command.**

The `cminst` command determines whether the Sun Management Center server or agent software has been installed. If only the Sun Management Center agents have been installed, `cminst` installs only the Change Manager agent package. No prompts appear.

Unconfiguring Software Applications

Just as some applications are configured using specific information and procedures, some applications are uninstalled and unconfigured using specific procedures. For example, you might remove host-specific information, such as host names, from configuration files to unconfigure an application.

Be sure to unconfigure software applications before you create the Solaris Flash archive. Then, the software stack is generalized and does not contain, for example, host-specific information about the master system.

Note – You might not be able to unconfigure or remove the host-specific information created by an application. In such cases, you cannot use Solaris Flash technology to deploy the application. Some software stores configuration information outside of UNIX file systems. Such software does not always configure correctly on managed hosts that are installed with Solaris Flash archives. An example is Sun Management Center, which stores host-specific information in an Oracle database. Because its host-specific information cannot be removed, Sun Management Center cannot be deployed using the Solaris Flash feature.

Configuration information that is host-specific and instance-specific can be provided at deployment time by using archive parameters and custom JumpStart finish scripts. This is described in “Creating a Customizable Solaris Flash Archive” on page 61.

Note – After you install the Solaris Flash archive on a managed host, some host-specific files are deleted and re-created for the managed host. The installation program uses the `sys-unconfig(1M)` command and the `sysidtool(1M)` command to delete and re-create the host-specific network configuration files. The files that are re-created include such files as `/etc/hosts`, `/etc/defaultrouter`, and `/etc/defaultdomain`.

Other Considerations



Caution – Do *not* configure boot environments on the master system by manually using the Solaris Live Upgrade commands `lu(1M)` and `lucreate(1M)`. Change Manager uses Solaris Live Upgrade tools to manage boot environments if they are specified in shared profiles and in host properties for managed hosts.

Do not provide runtime data for applications after installation on the master system. For example, do not create user data for a database server or an LDAP server after installing the database management software.

Note – Depending on the application, you might need to provide mechanisms for initializing this data when the managed host first boots.

Creating the Solaris Flash Archive From the Master System

Create the Solaris Flash archive of the integrated software stack after installing and configuring the software on the master system.

Use the `flarcreate(1M)` command to create the Solaris Flash archive.

For example, to create a Solaris Flash archive named `Netra082202.apache.flar`, type the following:

```
# /usr/sbin/flar create -n apacheServer -u ic_cfgparams \  
-c /flarchive/Netra082202.apache.flar
```

The `-n` option assigns its value, `apacheServer`, to the `content_name` keyword in the Solaris Flash archive. You can view archive keywords by using the browser interface or the command-line interface. See “How to View or Modify File Properties (Web Browser)” on page 137 or “How to View File or Folder Properties (Command Line)” on page 144.

`/flarchive` is the target directory name in which the Solaris Flash archive is created. The example command line creates an archive named `Netra082202.apache.flar` in the target directory.

Archive parameters *must* be described in a text file called `ic_cfgparams`. The file must be located in the directory from which the `flar create` command is invoked. This file must also be specified as a “user-defined section” of the Solaris Flash archive by using the `-u` option to the `flar create` command.

Note – Ensure that the target directory has sufficient disk space to accommodate the Solaris Flash archive.

Import this archive to the Change Manager repository for deployment to managed hosts.

Creating a Customizable Solaris Flash Archive

An archive might require that the user deploying it supply the information required to customize the archive for its production environment. To accomplish this, when you create the archive, include a special section that describes the required parameters, *archive parameters*. Also include custom JumpStart finish scripts to process the supplied values and modify the system accordingly.

Archive parameters are *name=value* pairs that are associated with the integrated software stack. These parameters provide the data to be processed by the finish scripts that are invoked to customize the software stack for the managed host. Custom JumpStart finish scripts are written by the stack creator. These scripts perform host-specific customizations on the managed host as part of the deployment process. Archive parameters obtain host-specific values through the Change Manager interface.

Creating the Archive Parameters File

An archive parameters file specifies application-specific parameters and default values. The archive parameters file contains entries in the following format:

- Parameter name (*name*)
- Label to be used by the browser interface (*label*)
- Optional default value (*default*)

The archive parameters file can be created by any text editor capable of saving files as plain ASCII text.

Following is a simple example of an archive parameter file:

```
name=telnet label="Do you want to enable telnet?" default=yes
name=ftp label="Do you want to enable ftp?" default=yes
name=finger label="Do you want to enable finger?" default=yes
```

Archive parameters *must* be described in a text file called `ic_cfgparams`. The file must be located in the directory from which the `flar create` command is invoked. This file must also be specified as a “user-defined section” of the Solaris Flash archive by using the `-u` option to the `flar create` command.

Processing the Archive Parameters File With Finish Scripts

As the final step in software stack deployment, Change Manager runs the finish scripts contained in the Solaris Flash archive. Change Manager provides a driver script that executes all user-supplied finish scripts that it finds in the `/etc/ichange.d` directory of the newly deployed software stack. This driver script provides access to the values specified in the archive parameters file, as supplied by the user.

Following is an example of a finish script that processes the archive parameters file created in the previous section:

```
#!/bin/sh

case `cmgetprop telnet` in
[Nn]*) telnet='#' ;;
*) telnet= ;;
esac

case `cmgetprop ftp` in
[Nn]*) ftp='#' ;;
*) ftp= ;;
esac

case `cmgetprop finger` in
[Nn]*) finger='#' ;;
*) finger= ;;
```

```

esac

ed $SI_ROOT/etc/inetd.conf <</
/^##telnet/s/^##/$telnet/
/^##ftp/s/^##/$ftp/
/^##finger/s/^##/$finger/
w
q
/

exit 0

```

When two or more finish scripts are included in the `/etc/install.d` directory, ensure that the `ic_cfgparams` file contains all of the parameters that the scripts process.

Store the finish scripts in the `/etc/ichange.d` directory prior to creating the Solaris Flash archive of the master system. The finish scripts *must* be part of the archive. If you have more than one finish script, they are processed in lexical order by file name.

Note – The finish scripts must have permissions set to 755. If the scripts are not executable, then the Solaris Flash archive is not customizable.

Finish scripts use an environment variable called `$SI_ROOT` and a `$PATH` that includes the `cmgetprop` command.

- `SI_ROOT` – This environment variable specifies the mount point of the file system being installed or updated.

For example, `$SI_ROOT/etc/passwd` points to the password file on the boot environment currently being installed.

- `cmgetprop` – This tool is used by finish scripts to determine the current value of an archive parameter. See `cmgetprop(1MCM)`.

The following example is based on the `ic_cfgparams` file described in “Creating the Archive Parameters File” on page 62. You might use `cmgetprop` as follows:

```
enable_telnet=`cmgetprop telnet`
```

This command line assigns the value associated with the `telnet` parameter to the shell variable `enable_telnet`.

The value of a parameter might be the default specified in the archive parameters description in `ic_cfgparams`, might come from a *shared profile* associated with the managed host, or might come from the host properties of the managed host. You can supply parameter values by using the browser interface. Modify values on the shared profile property page or the managed host property page. You can also supply parameter values by using the `changemgr filesset` and `changemgr hostset` commands of the command-line interface.

Using flar create to Create a Customizable Solaris Flash Archive

Use the `flarcreate(1M)` command to create the Solaris Flash archive. The `-u` option includes the archive parameter file in the user section of the Solaris Flash archive.

For example, to create a customizable Solaris Flash archive named `082202.apache.flar`, type the following:

```
# /usr/sbin/flar create -n apacheServer -u ic_cfgparams \  
-c /flarchive/082202.apache.flar
```

`/flarchive` is the target directory name in which the Solaris Flash archive is created. The example command line creates an archive named `082202.apache.flar` in the target directory.

Installing Solaris Flash Archives on Managed Hosts (Tasks)



Caution – Change Manager uses the Solaris Live Upgrade software to perform software update operations on managed hosts. Do *not* manually run Solaris Live Upgrade commands on managed hosts outside the context of Change Manager.

Running Live Upgrade commands in this way might result in Change Manager's obtaining an inconsistent view of the state of the managed host.

The main task performed by the Change Manager is to deploy software stacks to managed hosts. The Change Manager also performs remote operations on the managed hosts, such as *fallback*, *reboot*, and *halt*.

Change Manager supports the following deployment types:

Initial Installation Before an *initial installation*, managed hosts are assumed to have no software installed or have software installed that can be overwritten. To initiate an initial installation, you must manually run the following command on each managed host:

```
ok> boot net - install
```

Change Manager provides the network installation services for the managed host. Before you initiate the network boot, you must create custom JumpStart files for each managed host by running the Set Up for Install or `changemgr setup` operation.

Update The managed hosts are running a software stack that was installed by Change Manager (and running the Change Manager agent). An *update* uses the Solaris Live Upgrade feature to deploy software to the inactive boot environment. Initiate an update by running the Update or `changemgr update` operation.

Reinstallation	This operation is similar to an initial installation because the software installed on managed hosts is overwritten, software is <i>not</i> deployed to another boot environment. Initiate a <i>reinstallation</i> by running the Reinstall or <code>changemgr reinstall</code> operation.
----------------	--

Note – You must perform a Change Manager initial installation on a managed host before you can perform a Change Manager update or reinstallation on that managed host.

To prepare a managed host for future updates, configure your managed host with two *boot environments*. To prepare a managed host for future reinstallation operations, configure your managed host with one boot environment. See “Minimum Set of Parameters to Deploy Software” on page 176.

The following topics are covered in this chapter:

- “Solaris Deployment Technologies Used by Change Manager” on page 66
- “Change Manager Deployment File Types” on page 68
- “Installing Solaris Flash Archives on Managed Hosts by Using the Browser Interface (Task Map)” on page 73
- “Installing Solaris Flash Archives on Managed Hosts by Using the Browser Interface” on page 75
- “Installing Solaris Flash Archives on Managed Hosts by Using the Command-Line Interface (Task Map)” on page 83
- “Installing Solaris Flash Archives on Managed Hosts by Using the Command-Line Interface” on page 84

Solaris Deployment Technologies Used by Change Manager

Change Manager employs the following deployment technologies for performing initial installation, update, and reinstallation operations:

- Solaris Flash installation
- Solaris Live Upgrade
- Custom JumpStart installation

Solaris Flash Installation

The *Solaris Flash installation* enables you to create a single reference installation of the Solaris operating environment and other software applications on a system. This system is called the *master system*. Then, you can replicate that reference installation on a number of systems by using the Change Manager. These systems are called *managed hosts*. Installing managed hosts with the Solaris Flash archive is a four-part process that involves the following:

1. Installing the master system. Select a system and use any of the Solaris installation methods to install the Solaris operating environment and any other software.
2. Installing the Change Manager agent software on the master system. The agent software is required for Change Manager to remotely control managed hosts once the software stack has been installed.
3. Creating the Solaris Flash archive. The *Solaris Flash archive* is a single file that contains a software stack. The archive is a copy of all the files on the master system.
4. Installing the Solaris Flash archive on managed hosts. When you install the Solaris Flash archive on a managed host, all of the files in the archive are copied to that managed host. The newly installed managed host now has the same installation configuration as the original master system.

See Chapter 4 for information about creating Solaris Flash archives.

Managed hosts are not updated by adding packages or installing patches. Instead, you update and reconfigure the master system. Then, you create a new Solaris Flash archive that contains the updated software stack. The new archive can be installed on the managed hosts in a single step.

The Solaris Flash archives *must* be imported to the *Change Manager repository* before they can be installed on managed hosts.

Solaris Live Upgrade

Solaris Live Upgrade provides a method of upgrading that substantially reduces the usual service outage that is associated with an operating system upgrade. While the active *boot environment* continues to run, you can install a Solaris Flash archive on the inactive boot environment. The original system configuration remains fully functional and unaffected by the installation of the Solaris Flash archive. When you *reboot* the system, this boot environment becomes the active boot environment.

If a failure occurs, you have a safety net. You can quickly revert to the original boot environment by performing a *fall back*. This fall back action eliminates the downtime associated with the normal test and evaluation process.

Change Manager uses Solaris Live Upgrade to perform *updates* of managed hosts. Before you can perform updates, you must perform an initial installation by using Change Manager. This initial installation must create two boot environments so that an alternate boot environment is available for the update.

For more information about Solaris Live Upgrade, see “Solaris Live Upgrade (Overview)” in *Solaris 9 Installation Guide*.

Custom JumpStart Installation

Custom JumpStart is a command-line interface that enables you to automatically install several systems, based on JumpStart profiles that you create. These profiles define specific software installation requirements. You can also incorporate shell scripts to include preinstallation tasks and postinstallation tasks. You choose which profile and scripts to use for installation. Custom JumpStart then installs the system.

Change Manager uses the custom JumpStart installation method to perform the *initial installations* and *reinstallations* of managed hosts.

See “Preparing Custom JumpStart Installations (Tasks)” in *Solaris 9 Installation Guide*.

Change Manager Deployment File Types

The Change Manager uses deployment files as input for jobs.

You can use folders to create a hierarchy in which to organize these Change Manager files. These files and folders are stored in the repository. You can organize the folders and files in any way that you want.

Access the repository in the browser user interface by clicking the Files tab. Access the repository with the command-line interface by using the file management subcommands of the `changemgr` command.

You might organize the folders and files in the following ways:

- **Group like file types** – For example, store all the Solaris Flash archives in a single folder. Do the same for Solaris boot images, shared profiles, and manifests.
- **Group files related to a particular set of managed hosts** – Create a folder to hold all the files associated with a particular service’s servers.

For example, a *server farm* provides web services. Therefore, create a folder named `WebServer`. In the `WebServer` folder, store the files used by the web server, such as the archives, boot images, shared profiles, and manifests. Create a separate

folder to hold files associated with a mail server.

- **Group by user name** – Store all files in folders owned by specific users. For example, store all of Joe’s files in a folder named `joe`. Then, Joe can organize his folders and files in the way he wants.
- **Group all files associated with a particular archive** – Store all files associated with each archive in folders. For example, the archive and associated files for the Apache web server are stored in a folder named `apache-web-server`. Store the archive, boot image, and shared profile in the same folder.

Files stored in the Change Manager repository have a standard set of properties associated with them. The following properties are shared by all files:

Description	User-supplied string that describes the file.
Owner	Read-only property that names the owner of the file.
State	Read-only property that indicates the state of the file.

Note – When using the browser interface, you must perform the operations on the File Actions drop-down menu while in the appropriate folder.

For example, to create a folder inside an existing folder, go to that folder *before* choosing New Folder from the File Actions menu.

When using the browser interface, you can select items from a list. To select an item from a list, click the checkbox next to the item name. Then, choose the action to perform from the File Actions drop-down menu.

Shared Profile

A *shared profile* is a set of Solaris system configuration parameters that are used to install managed hosts in a consistent, repeatable manner. Once created, a shared profile becomes a template that can be applied to one or more managed hosts. A shared profile specifies customizations such as disk slicing, root password, network interfaces, naming service, time zone, and locale. Each profile can specify the Solaris Flash archive to be deployed to the managed host. Every managed host must have a shared profile associated with it.

Once applied to a specific managed host, the shared profile data becomes part of the *host properties* for that managed host.

Use the `changemgr fileset` command to change property values for a shared profile in the repository. You can also change property values by making changes to property values on the shared profile's property page. However, when the shared profile is outside of the repository, you manipulate properties by editing the properties and property values contained in the file. See the `cmsp(4CM)` man page.

The shared profile file name must use the `.cmsp` suffix.

To create or import shared profiles, see "How to Create a Shared Profile (Web Browser)" on page 77 and "How to Import a Shared Profile to the Change Manager Repository (Web Browser)" on page 78 or "How to Import Shared Profiles to the Change Manager Repository (Command Line)" on page 88.

To deploy software to a managed host, you must import the shared profile to the Change Manager repository. See "How to Reinstall, Update, Fall Back, and Reboot Managed Hosts (Web Browser)" on page 81, or "How to Perform an Initial Installation (Command Line)" on page 91 and "How to Update Managed Hosts (Command Line)" on page 93.

Understanding Shared Profiles and Host Properties

Shared profiles and host properties are used by the Change Manager to describe how one or more managed hosts are to be configured with a software stack. Much of the information specified by shared profiles and host properties is the same as described in a custom JumpStart installation profile.

A *shared profile* can be used by one or more managed hosts to describe the way managed hosts are configured with the software stack.

Host properties describe *exactly* one managed host. These properties describe the exact configuration of the software stack on the particular managed host. The host properties point to the shared profile. You can further customize the managed host by doing the following:

- Overriding archive parameter values in the shared profile by providing new values for the same archive parameters
- Overriding parameter values in the shared profile by providing new values for the same parameters
- Providing values not already specified in the shared profile

Solaris Boot Image

A *Solaris boot image* is a set of files that is used with a matching archive to install and update managed hosts. The Solaris version of the boot image and the archive must be identical for installation tasks and update tasks to succeed. The Solaris boot image is used as input for an installation or an update action and is associated with an archive. A Solaris boot image is also known as a miniroot.

For installations, the boot image boots the Solaris operating environment on the managed host and runs the Solaris Flash installation program. For updates, the boot image runs the Solaris Flash installation program.

A single boot image can support several archives. The Solaris version of the boot image and the archive must match. For example, a Solaris 8 2/02 boot image must be used to deploy archives based on the Solaris 8 2/02 release.

The Solaris boot image file name must use the `.miniroot` suffix.

In addition to the general file properties, a Solaris boot image is associated with the following property:

<code>OSVersion</code>	User-supplied string that describes the version of the Solaris operating system associated with the boot image.
------------------------	---

To deploy software to a managed host, see “How to Perform an Initial Installation (Web Browser)” on page 80 and “How to Reinstall, Update, Fall Back, and Reboot Managed Hosts (Web Browser)” on page 81, or “How to Perform an Initial Installation (Command Line)” on page 91, “How to Reinstall Managed Hosts (Command Line)” on page 92, and “How to Update Managed Hosts (Command Line)” on page 93.

Solaris Flash Archive

A *Solaris Flash archive* is a file that contains a software stack. This stack can be deployed to hosts managed by the Change Manager. The Solaris version of the archive must match that of the boot image used for deployment. The archive is used as input for an installation, reinstallation, or update action. The managed host or a shared profile specifies the archive to use.

To deploy an archive, a matching Solaris boot image must already exist in the Change Manager repository.

The Solaris Flash archive file name must use the `.flar` suffix.

In addition to the general file properties, a Solaris Flash archive is associated with the following property:

BootImage User-supplied string that describes the Solaris boot image associated with this Solaris Flash archive.

To deploy software to a managed host, see “How to Perform an Initial Installation (Web Browser)” on page 80 and “How to Reinstall, Update, Fall Back, and Reboot Managed Hosts (Web Browser)” on page 81, or “How to Perform an Initial Installation (Command Line)” on page 91, “How to Reinstall Managed Hosts (Command Line)” on page 92, and “How to Update Managed Hosts (Command Line)” on page 93.

For a description of the archive keywords, see `flash_archive(4)`.

Folder

A *folder* is a container that can hold files and other folders. Click a folder name to go into that folder. Then, view the folder’s contents. Change Manager files can be the following:

- Solaris Flash archive
- Solaris boot image
- Shared profile
- Manifest
- Audit rules file
- Report

Perform the following actions from the folder page:

- Create folders, shared profiles, and audit rules files.
- Import Solaris Flash archives, Solaris boot images, shared profiles, audit rules files, and manifests to the Change Manager repository.
- Rename folders and files.
- Export files.
- Create a copy of a shared profile or an audit rules file in the current folder.
- Move folders and files to another folder.
- Delete folders and files.

To create folders, see “How to Create a Folder (Web Browser)” on page 134 or “How to Create a Folder (Command Line)” on page 139.

Installing Solaris Flash Archives on Managed Hosts by Using the Browser Interface (Task Map)

The following table identifies the procedures to follow to install Solaris Flash archives on managed hosts by using the browser interface.

Task	Description	For Instructions
Import a Solaris boot image to the Change Manager repository.	Find a copy of the Solaris boot image that matches the Solaris version of the archive. Then, import the Solaris boot image to the Change Manager repository.	See “How to Import Solaris Boot Images to the Change Manager Repository (Web Browser)” on page 76.
Import a Solaris Flash archive to the repository.	<ul style="list-style-type: none">■ If the software stack is already stored as a Solaris Flash archive in the Change Manager repository, then the archive can be deployed.■ If the archive is not in the repository, then do one of the following:<ul style="list-style-type: none">■ Import the archive to the repository.■ Create the archive and import it to the repository.	<ul style="list-style-type: none">■ See Chapter 4.■ See “How to Import Solaris Flash Archives to the Change Manager Repository (Web Browser)” on page 77.
Create a shared profile.	Create a shared profile that describes how to configure a set of managed hosts.	See “How to Create a Shared Profile (Web Browser)” on page 77.
Import a shared profile.	Import a shared profile that describes how to configure a set of managed hosts.	See “How to Import a Shared Profile to the Change Manager Repository (Web Browser)” on page 78.
Add a host to be managed by the Change Manager.	The managed host can use a shared profile. Parameter values in the host properties override those specified in the shared profile.	See “How to Add a Managed Host (Web Browser)” on page 79.

Task	Description	For Instructions
Perform an initial installation.	Perform an initial installation of the Solaris Flash archive on managed hosts. When installed with the archive, these managed hosts can be remotely controlled by Change Manager.	See “How to Perform an Initial Installation (Web Browser)” on page 80.
Reinstall a managed host with a Solaris Flash archive.	Reinstall a managed host with a Solaris Flash archive. Unlike initial installation, which must be initiated manually on each managed host, the reinstallation is initiated by the Change Manager.	See “How to Reinstall, Update, Fall Back, and Reboot Managed Hosts (Web Browser)” on page 81.
Update a managed host with a Solaris Flash archive.	Use Solaris Live Upgrade to update a managed host with a Solaris Flash archive. The update is performed by installing the archive on the inactive boot environment of the managed host.	See “How to Reinstall, Update, Fall Back, and Reboot Managed Hosts (Web Browser)” on page 81.
Fall back to the previous boot environment after performing an update.	Fall back to the previous boot environment if you want to run the software stack on a previous boot environment. You might fall back because the stack running on the active boot environment is bad. You might also fall back when you want to run the software stack that is installed on the other boot environment. You can only perform a fallback of a managed host you updated.	See “How to Reinstall, Update, Fall Back, and Reboot Managed Hosts (Web Browser)” on page 81.
Reboot a managed host.	Reboot one or more managed hosts.	See “How to Reinstall, Update, Fall Back, and Reboot Managed Hosts (Web Browser)” on page 81.

Installing Solaris Flash Archives on Managed Hosts by Using the Browser Interface

Initiate deployment jobs from the Hosts section. Click the Hosts tab to go to the Hosts section.

Navigate through the hierarchy of *host groups* and *managed hosts*. Host groups can contain managed hosts and other host groups. Perform actions on host groups and managed hosts.

Click a host group name to change to that host group and see its contents. Click a managed host's name to see its properties.

To learn how to create folders and perform management tasks in the Change Manager repository, see Chapter 8. None of the procedures described in Chapter 8 are required to perform deployment tasks, though you might want to create a hierarchy of folders in the repository.

To learn how to create host groups and perform management tasks on the Change Manager topology, see Chapter 9. None of the procedures described in Chapter 9 are required to perform deployment tasks, though you might want to create a hierarchy of host groups in the topology.

To learn how to navigate through the browser interface, see Appendix A.

▼ How to Access the Files Section and Appropriate Folder (Web Browser)

Note that the top of the Files section hierarchy is a folder.

1. **To go to the Files section, click the Files tab in the general links area at the top of the page.**

The top-level Files page shows a table, which can contain files and folders. The table is a file manager.

2. **Drill down to the appropriate folder.**

Click a folder name to go into that folder. Then, view the folder's contents. Continue to click folder names until you reach the folder or file you want.

▼ How to Import Solaris Boot Images to the Change Manager Repository (Web Browser)

The Solaris boot image is used to deploy software stacks to managed hosts.

For an initial installation, the managed host boots and mounts a small Solaris root. The root is contained in the boot image. Then, the managed host runs the Solaris installation program. For an update, the managed host runs the Solaris installation program, which is stored on the boot image.

The time required to import a file to the Change Manager repository depends on the size of the file and the speed of the network.

1. **If you are not already in the appropriate folder, see “How to Access the Files Section and Appropriate Folder (Web Browser)” on page 75.**
 2. **From the File Actions menu, choose Import Boot Image.**
 3. **Supply the pertinent information:**
 - Boot image name, which describes the version of Solaris and architecture supported, for example, `Solaris8_202_sun4u`. Add the `.miniroot` suffix to complete the boot image name, `Solaris8_202_sun4u.miniroot`.
 - Path to the boot image. Click Browse to find the boot image.

The path to the boot image must point to the top directory of the Solaris installation media. The installation media can be on a CD or on another system on the network. The top directory of the Solaris installation media contains the `Copyright` and `installer` files, and either the `Solaris_8` or `Solaris_9` directory. These directories contain the Solaris packages and the Solaris boot image.
-
- Note** – If you import the boot image from a CD, point to the directory named something like `/cdrom/Solaris version/s0`. For example, the directory for a Solaris 9 boot image would be `/cdrom/sol_9_sparc/s0`.
-
- Solaris version that the boot image supports, for example `Solaris 8 2/02`.
4. **When the information is complete, click Import to copy the Solaris boot image to the Change Manager repository.**

Click Cancel to return to the previous page.

▼ How to Import Solaris Flash Archives to the Change Manager Repository (Web Browser)

Import a Solaris Flash archive from another system on the network, perhaps the master system on which it was created. This archive is a software stack that can be deployed to managed hosts.

The time required to import a file to the Change Manager repository depends on the size of the file and the speed of the network.

1. **If you are not already in the appropriate folder, see “How to Access the Files Section and Appropriate Folder (Web Browser)” on page 75.**
2. **From the File Actions menu, choose Import Archive.**
3. **Supply the following information:**
 - Archive name. Choose a meaningful name. For example, choose a name that describes the software contents or purpose of the archive, such as `apache_webserver`. Add the `.flar` suffix to complete the archive name, `apache_webserver.flar`.
 - Path to the archive outside the Change Manager repository. Click Browse to find the archive.
 - Path to the Solaris boot image in the Change Manager repository that supports the same Solaris version and architecture.
4. **When the information is complete, click Import to import the audit rules file.**
Click Cancel to return to the previous page.

▼ How to Create a Shared Profile (Web Browser)

1. **If you are not already in the appropriate folder, see “How to Access the Files Section and Appropriate Folder (Web Browser)” on page 75.**
2. **From the File Actions menu, choose New Shared Profile.**
The shared profile property page appears.
3. **Use the wizards in each section to create the shared profile.**
Launch each wizard by clicking the Edit button associated with particular properties. Each page requires information that is used to create the profile. Return to previous pages by clicking buttons or clicking on the step description links in the left panel.
4. **After selecting values for the profile, click Finish to set the property values on the property page.**
Click Cancel to exit the wizard and return to the previous page.

5. **When the properties have the values you want, click Save to create the shared profile.**

Click Cancel to exit the shared profile property page without saving changes and to return to the previous page.

▼ How to Import a Shared Profile to the Change Manager Repository (Web Browser)

The shared profile describes how the managed hosts should be configured at deployment time. For a description of the shared profile's format, see "Shared Profile" on page 69.

If the shared profile contains a property with an invalid value, for example the value of `base_config_flar_archive` does not refer to an existing archive, then the import fails. Check the job queue (see "How to View the Job Queue (Web Browser)" on page 124) to determine whether the import failed. If the import failed, correct the property value and reinitiate the import operation.

The time required to import a file to the Change Manager repository depends on the size of the file and the speed of the network.

1. **If you are not already in the appropriate folder, see "How to Access the Files Section and Appropriate Folder (Web Browser)" on page 75.**
2. **From the File Actions menu, choose Import Shared Profile.**
3. **Supply the following information:**
 - Profile name. Choose a meaningful name. For example, choose a profile name that describes the software customizations or the managed host's hardware type, such as `webserver_sun4u`. Add the `.cmsp` suffix to complete the shared profile name, `webserver_sun4u.cmsp`.
 - Path to the shared profile outside the Change Manager repository. Click Browse to find the profile.
4. **When the information is complete, click Import to copy the profile file to the Change Manager repository.**

Click Cancel to return to the previous page.

▼ How to Access the Hosts Section and Appropriate Administrative Domain and Host Group (Web Browser)

1. **To go to the Hosts section, click the Hosts tab in the general links area at the top of the page.**

- If more than one administrative domain exists, you go to a page showing a table that lists the available administrative domains. Go to Step 2.
- If only one administrative domain exists, the page shows a table that lists managed hosts and host groups in the default domain. Go to Step 3.

2. (Optional) Click the name of the administrative domain to use.

Note – Use Sun Management Center to create a new administrative domain. See “Using Sun Management Center Administrative Domains” in *Sun Management Center 3.0 Software User’s Guide*.

3. Drill down to the appropriate host group.

Click a host group name to go into that host group. Then, view the host group’s contents. Continue to click host group names until you reach the host group or managed host you want.

▼ How to Add a Managed Host (Web Browser)

Managed host properties are the same as those specified for shared profiles. For information about the properties and property values, see Chapter 10.

Note – A managed host can be a client of only *one* Change Manager server. To change control of a managed host to another Change Manager server, see “Internal error: unable to establish probe connection Appears When Running Jobs on Managed Hosts” on page 197.

1. **If you are not already in the appropriate host group, see “How to Access the Hosts Section and Appropriate Administrative Domain and Host Group (Web Browser)” on page 78.**
2. **From the Host Actions menu, choose Add Host.**
The host property page appears.
3. **Supply the following information:**
 - Host name.
 - Ethernet address of the managed host.
 - *Platform group* of the managed host.
 - Port number configured on the agent to communicate with the server.

Note – If you change the value of this property after installing a managed host, the Change Manager server will no longer be able to communicate with it. To reestablish communication with the server by using the new agent port, you must re-initialize the managed host by performing an initial installation on it.

- Shared profile to use to install or update the managed host.
- Parameter values that customize the Solaris Flash archive for the managed host.

Note – If a shared profile already exists for this managed host, you only need to specify the name of the shared profile. You can override any archive-specific parameter values specified in the shared profile by clicking the Load button. Then, you can update these parameter value fields of the host properties.

4. Click Add to add the managed host.

Click Cancel to return to the previous page.

▼ How to Perform an Initial Installation (Web Browser)

To perform an initial installation, you must first *set up for initial installation*. The setup creates the custom JumpStart files based on information in the shared profile and host properties. Then, you must initiate the initial installation from the console of each managed host to be installed.

- 1. Make sure that the managed hosts you want to install have been added to the Change Manager server.**
See “How to Add a Managed Host (Web Browser)” on page 79.
- 2. Modify the shared profiles and host properties to reflect the configuration of the managed hosts you want.**
 - To configure the managed hosts for reinstallation operations, configure one boot environment.
 - To configure the managed hosts for updates, create two boot environments. See “Minimum Set of Parameters to Deploy Software” on page 176.
- 3. If you are not already in the appropriate host group, see “How to Access the Hosts Section and Appropriate Administrative Domain and Host Group (Web Browser)” on page 78.**
- 4. From the Host Actions menu, choose Set Up for Install.**

This action creates the custom JumpStart files needed to perform the initial installation.



Caution – If you modify the associated shared profile or host properties again before you perform the initial installation, you must recreate the JumpStart profiles. To recreate the JumpStart profiles, rerun Set Up for Install before performing `boot net - install`.

5. **Supply a meaningful job name with which to track the job's progress.**
6. **Click Submit to initiate the action.**
Click Cancel to return to the previous page.
7. **From the console of each of the managed hosts to be installed, do the following:**
 - a. **Bring each managed host to the `ok>` prompt.**
If the managed host is running, press Stop-A.
 - b. **On each console, type `boot net - install` and press Return.**
Be sure to include the space between the - and `install`.



Caution – Make sure that the managed host is *only* a network boot client of the Change Manager server.

The network boot of your managed host might fail with an error message such as `Panic: unable to mount file systems`. If such a message appears, then your managed host is probably being served by more than one network boot server. See “Panic: unable to mount file systems Message Appears While Booting From the Network” on page 203.

▼ How to Reinstall, Update, Fall Back, and Reboot Managed Hosts (Web Browser)

1. **If you are not already in the appropriate host group, see “How to Access the Hosts Section and Appropriate Administrative Domain and Host Group (Web Browser)” on page 78.**
2. **Perform one of the following actions:**
 - To perform a *reinstallation*, choose Reinstall from the Host Actions menu.
 - To perform an *update*, choose Update from the Host Actions menu.

Note – First use the Change Manager to perform an initial installation before using the *Solaris Live Upgrade* feature on a managed host. The initial installation creates two *boot environments* by using the `lucreate` command.

Modify the shared profiles and host properties to reflect the configuration of the managed hosts.

- To *fall back* to the previous version of the software stack, choose Fall Back from the Host Actions menu.

The fallback operation “undoes” the last update attempt of a managed host, whether it finished or did not start.

For example, three managed hosts are updated one at a time. The update operation completes on the first managed host. Then, the update begins on the second managed host. When the first managed host boots the updated boot environment, you notice that there are problems with the system. You cancel the running update.

Each of the three managed hosts are in a different state. The first managed host completed the update. The second managed host started the update, but did not complete it. The third managed host did not start the update.

The fallback operation ensures that each of these managed hosts reverts to the boot environment running prior to the update attempt.

The fallback feature fails if the system cannot boot. In such cases, see “Solaris Live Upgrade (Overview)” in *Solaris 9 Installation Guide*.

- To *reboot* managed hosts, choose Reboot from the Host Actions menu.

3. Supply a meaningful job name.

For example, the job name might be `Update host1` and `host2`.

4. Determine when you want to run the job, either now or at another time.

- To initiate the job immediately, click the Start Now radio button.
- Run the job at a later time by specifying the start date and start time.
 - Start date. Click the date or specify the date in the *mm/dd/yyyy* format.
mm and *dd* are two-digit forms for the month and day. *yyyy* is the four-digit form for the year.
 - Start time. Choose the start time from the hour and minute pull-down menus.

5. Click Submit to initiate the action.

Click Cancel to return to the previous page.

Installing Solaris Flash Archives on Managed Hosts by Using the Command-Line Interface (Task Map)

The following table identifies the procedures to follow to install Solaris Flash archives on managed hosts by using the command-line interface. See the `changemgr(1MCM)` man page.

Task	Description	For Instructions
Import a Solaris boot image to the Change Manager repository.	Find a copy of the Solaris boot image that matches the Solaris version of the archive. Then, import the Solaris boot image to the Change Manager repository.	See “How to Import Solaris Boot Images to the Change Manager Repository (Command Line)” on page 85.
Import a Solaris Flash archive to the repository.	<ul style="list-style-type: none">■ If the software stack is already stored as a Solaris Flash archive in the Change Manager repository, then the archive can be deployed.■ If the archive is not in the repository, then do one of the following:<ul style="list-style-type: none">■ Import the archive to the repository.■ Create the archive and import it to the repository.	<ul style="list-style-type: none">■ See Chapter 4.■ See “How to Import Solaris Flash Archives to the Change Manager Repository (Command Line)” on page 87.
Import a shared profile.	Import a shared profile that describes how to configure a set of managed hosts.	See “How to Import Shared Profiles to the Change Manager Repository (Command Line)” on page 88.
Add a host to be managed by the Change Manager.	The managed host can use a shared profile. Host property values override those specified in the shared profile.	See “How to Add Managed Hosts (Command Line)” on page 89.
Perform an initial installation.	Use custom JumpStart to perform an initial installation of a Solaris Flash archive on a managed host.	See “How to Perform an Initial Installation (Command Line)” on page 91.

Task	Description	For Instructions
Reinstall a managed host with a Solaris Flash archive.	Reinstall a managed host with a Solaris Flash archive. Unlike initial installation, which must be initiated manually on each managed host, the reinstallation is initiated by the Change Manager.	See “How to Reinstall Managed Hosts (Command Line)” on page 92.
Update a managed host with a Solaris Flash archive.	Use Solaris Live Upgrade to update a managed host with a Solaris Flash archive. The update operation is performed by installing the archive on the inactive boot environment of the managed host.	See “How to Update Managed Hosts (Command Line)” on page 93.
Fall back to the previous boot environment after performing an update.	Fall back to the previous boot environment if you want to run the software stack on a previous boot environment. You might fall back because the stack running on the active boot environment is bad. You might also fall back when you want to run the software stack that is installed on the other boot environment. You can only perform a fallback of a managed host you updated.	See “How to Fall Back to the Previous Version of the Software Stack (Command Line)” on page 94.
Reboot a managed host.	Reboot one or more managed hosts.	See “How to Reboot Managed Hosts (Command Line)” on page 95.
Halt a managed host.	Halt one or more managed hosts.	See “How to Halt Managed Hosts (Command Line)” on page 95.

Installing Solaris Flash Archives on Managed Hosts by Using the Command-Line Interface

The following procedures describe how to perform deployment tasks by using the Change Manager command-line interface. You can use the command-line interface to perform tasks such as importing Solaris Flash archives and performing updates.

To learn how to create folders and perform management tasks in the Change Manager repository, see Chapter 8. None of the procedures described in Chapter 8 are required to perform deployment tasks, though you might want to create a hierarchy of folders in the repository.

To learn how to create host groups and perform management tasks on the Change Manager topology, see Chapter 9. None of the procedures described in Chapter 9 are required to perform deployment tasks, though you might want to create a hierarchy of host groups in the topology.

▼ How to Import Solaris Boot Images to the Change Manager Repository (Command Line)

The Solaris boot image is used to deploy software stacks to managed hosts.

The time required to import a file to the Change Manager repository depends on the size of the file and the speed of the network.

For an initial installation, the managed host boots and mounts a small Solaris root. The root is contained in the boot image. Then, the managed host runs the installation program. For an update, the managed host runs the installation program, which is stored on the boot image.

1. Determine where the boot image exists and where to store it.

For example, copy the boot image from `/net/test1/home/suzi/s9fcs` to the `/` folder.

The path to the boot image must point to the top directory of the Solaris installation media. The installation media can be on a CD or on another system on the network. The top directory of the Solaris installation media contains the Copyright and installer files, and either the `Solaris_8` or `Solaris_9` directory. These directories contain the Solaris packages and the Solaris boot image.

Note – If you import the boot image from a CD, point to the directory named something like `/cdrom/Solaris version/s0`. For example, the directory for a Solaris 9 boot image would be `/cdrom/sol_9_sparc/s0`.

2. Import a Solaris boot image to the Change Manager repository by using one of these `changemgr import` commands.

- The following command line imports one file at a time. You can also use this command line to rename the file.

```
$ changemgr import [ -u username ] [ -p file ] filepath[.type] \
relfilepath.type
```

- The following command line imports several files to a folder simultaneously.

```
$ changemgr import [ -u username ] [ -p file ] filepath.type ... \
reldirpath
```

- u *username* Specify the user name to authenticate. If this option is not specified, the user is the current UNIX user.
- p *file* *file* consists of a single line, which contains the password. If *file* is -, then the user can supply the password as standard input.

If the -p option is not supplied, then the changemgr command prompts the user for his password.
- filepath* Specifies an absolute or relative path to a file. This file path is not within the Change Manager repository.
- relfilepath* Specifies the path to a file, *not* including a folder, that is relative to the top of the Change Manager repository.
- reldirpath* Specifies the path to a folder that is relative to the top of the Change Manager repository.
- .type* Specifies the file name suffix that represents the file type. A Solaris boot image uses the .miniroot suffix.

Choose a file name that indicates the versions of the Solaris operating environment the boot image supports. For example, create a boot image named Solaris9.miniroot.

Example—Importing a Solaris Boot Image to the Change Manager Repository

Suzi copies the boot image from the /net/test1/home/suzi/Solaris_9 directory to the / folder. She calls the boot image Solaris_9.miniroot.

```
$ changemgr import /net/test1/home/suzi/Solaris_9 \
/Solaris_9.miniroot
```

Example—Importing Solaris Boot Images to the Change Manager Repository

Suzi copies the boot images from the /net/test1/home/suzi/Solaris_9 and /net/test1/home/suzi/Solaris_8.202 directories to the /BootImages folder.

```
$ changemgr import /net/test1/home/suzi/Solaris_9 \
/net/test1/home/suzi/Solaris_8.202 /BootImages
```

▼ How to Import Solaris Flash Archives to the Change Manager Repository (Command Line)

Import a Solaris Flash archive from another system, typically the master system on which it was created, on the network. This archive contains a software stack that can be deployed to managed hosts.

The time required to import a file to the Change Manager repository depends on the size of the file and the speed of the network.

1. Determine where the archive exists and where to store it.

For example, copy the archive from `/net/test1/home/suzi/apache.flar` to the `web-server` folder.

2. Import a Solaris Flash archive to the Change Manager repository by using one of these `changemgr import` commands.

- The following command line imports one file at a time. You can use the command line to rename the file.

```
$ changemgr import [ -u username ] [ -p file ] filepath[.type] \
relfilepath.type
```

- The following command line imports several files to a folder simultaneously.

```
$ changemgr import [ -u username ] [ -p file ] filepath.type ... \
reldirpath
```

`.type` Specifies the file name suffix that represents the file type. A shared profile uses the `.flar` suffix.

For descriptions of the other options, see “How to Import Solaris Boot Images to the Change Manager Repository (Command Line)” on page 85.

Choose a meaningful name that indicates the type of archive. For example, create an archive named `apache.flar`.

Example—Importing a Solaris Flash Archive to the Change Manager Repository

Suzi copies the archive called `/net/test1/home/suzi/apache.flar` to the `web-server` folder. She renames the file to be `Apache.flar`.

```
$ changemgr import /net/test1/home/suzi/apache.flar \
/web-server/Apache.flar
```

Example—Importing Solaris Flash Archives to the Change Manager Repository

Suzi copies the archives called `/net/test1/home/suzi/apache.flar` and `/net/test1/home/suzi/oracle.flar` to the `/` folder.

```
$ changemgr import /net/test1/home/suzi/apache.flar \  
/net/test1/home/suzi/oracle.flar /
```

▼ How to Import Shared Profiles to the Change Manager Repository (Command Line)

The shared profile describes how the managed hosts should be configured at deployment time. For a description of the shared profile's format, see "Shared Profile" on page 69.

If the shared profile contains a property with an invalid value, for example the value of `base_config_flar_archive` does not refer to an existing archive, then the import fails. Check the job queue (see "How to View the Job Queue (Web Browser)" on page 124) to determine whether the import failed. If the import failed, correct the property value and reinitiate the import operation.

The time required to import a file to the Change Manager repository depends on the size of the file and the speed of the network.

1. Determine where the shared profile exists and where to store it.

For example, copy the shared profile from `/net/test1/home/suzi/apache.cmsp` to the `web-server` folder.

2. Import a shared profile to the Change Manager repository by using one of these `changemgr import` commands.

- The following command line imports one file at a time. You can also use this command line to rename the file.

```
$ changemgr import [ -u username ] [ -p file ] filepath[.type] \  
relfilepath.type
```

- The following command line imports several files to a folder simultaneously.

```
$ changemgr import [ -u username ] [ -p file ] filepath.type ... \  
reldirpath
```

`.type` Specifies the file name suffix that represents the file type. A shared profile uses the `.cmsp` suffix.

For descriptions of the other options, see "How to Import Solaris Boot Images to the Change Manager Repository (Command Line)" on page 85.

Choose a file name that indicates the unique features specified by the shared profile. For example, create a shared profile named `apache.cmsp` to configure the managed hosts that run the Apache web server.

Example—Importing a Shared Profile to the Change Manager Repository

Suzi copies the shared profile called `/net/test1/home/suzi/apache.cmsp` to the `web-server` folder at the top of the repository. She renames the file to be `Apache.cmsp`.

```
$ changemgr import /net/test1/home/suzi/apache.cmsp \  
/web-server/Apache.cmsp
```

Example—Importing Shared Profiles to the Change Manager Repository

Suzi copies the shared profiles called `/net/test1/home/suzi/apache.cmsp` and `/net/test1/home/suzi/oracle.cmsp` to the `/MyProfiles` folder.

```
$ changemgr import /net/test1/home/suzi/apache.cmsp \  
/net/test1/home/suzi/oracle.cmsp MyProfiles
```

▼ How to Add Managed Hosts (Command Line)

To simplify naming of managed hosts, you can make each name match the name of the actual machine.

Note – If you change the value of the `AgentPort` property after installing a managed host, the Change Manager server will no longer be able to communicate with it. To reestablish communication with the server by using the new agent port, you must re-initialize the managed host by performing an initial installation on it.

Note – A managed host can be a client of only *one* Change Manager server. To change control of a managed host to another Change Manager server, see “Internal error: unable to establish probe connection Appears When Running Jobs on Managed Hosts” on page 197.

1. Determine where to create the managed host.

For example, create a managed host in the web-server host group.

2. Use one of these `changemgr add` commands to add the managed host.

- The following command adds a managed host to be controlled by the Change Manager. A managed host can be created in a host group that is part of the Change Manager topology. *hostpath* is the full path name or relative path name to the managed host, which includes the host group hierarchy.

```
$ changemgr add [ -u username ] [ -p file ] [ -d domain ] \  
hostname hostpath
```

- The following command adds the specified hosts to the specified host group. The topology names are the same as the host names.

```
$ changemgr add [ -u username ] [ -p file ] [ -d domain ] \  
hostname ... grouppath
```

-u <i>username</i>	Specify the user name to authenticate. If this option is not specified, the user is the current UNIX user.
-p <i>file</i>	<p><i>file</i> consists of a single line, which contains the password. If <i>file</i> is -, then the user can supply the password as standard input.</p> <p>If the -p option is not supplied, then the <code>changemgr</code> command prompts the user for his password.</p>
-d <i>domain</i>	Specify the administrative domain on which to operate. In the context of a session, the default is the domain specified for the session. If no domain is specified, <i>domain</i> is the user's home domain. By default, <i>domain</i> is the user's home domain.
<i>hostname</i>	Specifies the network name of a host, for example, <code>host1.yourcompany.com</code> .
<i>hostpath</i>	Specifies the path to a managed host that is relative to the top of the selected administrative domain.
<i>grouppath</i>	Specifies the path to a host group that is relative to the top of the selected administrative domain.

Example—Adding a Managed Host

Chris creates the `host1` managed host in the `web-server/apache` host group.

```
$ changemgr add host1 /web-server/apache
```

Example—Adding a Managed Host and Changing Its Name

Chris adds the `host1` managed host to the `web-server/apache` host group and changes the host name to `Host1`.

```
$ changemgr add host1 /web-server/apache/Host1
```

Example—Adding Managed Hosts to a Host Group

Chris adds the `host1` and `host2` managed hosts to the `web-server/apache` host group.

```
$ changemgr add host1 host2 /web-server/apache
```

▼ How to Perform an Initial Installation (Command Line)

The initial installation must be initiated from each managed host to be installed.

1. **Ensure that the managed hosts you want to install have been added to the Change Manager server.**

See “How to Add Managed Hosts (Command Line)” on page 89.

2. **Determine which managed hosts you want to install.**

For example, install the `/web-server/host1` and `/web-server/host2` managed hosts.

3. **Modify the shared profiles and host properties to reflect the configuration of the managed hosts.**

- To configure the managed hosts for reinstallation operations, configure one boot environment.
- To configure the managed hosts for updates, configure two boot environments.

4. **Set up the files for installation.**

```
$ changemgr setup [ -u username ] [ -p file ] [ -d domain ] \  
topopath ...
```

topopath Specifies the path to a managed host or host group. The managed host or host group is relative to the top of the specified administrative domain.

For descriptions of the other options, see “How to Add Managed Hosts (Command Line)” on page 89.



Caution – If you modify the associated shared profile or host properties again before you perform the initial installation, you must recreate the JumpStart profiles. To recreate the JumpStart profiles, rerun `changemgr setup` before performing `boot net - install`.

5. Go to the console of each of the managed hosts to be installed and do the following:

- a. **Bring each managed host to the `ok>` prompt.**
If the managed host is running, press Stop-A.
- b. **On each console, type `boot net - install` and press Return.**
Be sure to include the space between the `-` and `install`.



Caution – Make sure that the managed host is *only* a network boot client of the Change Manager server.

The network boot of your managed host might fail with an error message such as `Panic: unable to mount file systems`. If such a message appears, then your managed host is probably being served by more than one network boot server. See “Panic: unable to mount file systems Message Appears While Booting From the Network” on page 203.

▼ How to Reinstall Managed Hosts (Command Line)

Note – First use the Change Manager to perform an initial installation that creates a single *boot environment* before performing a *reinstallation* of a managed host.

1. **Determine which managed hosts you want to reinstall.**
For example, reinstall the `/web-server/host1` and `/web-server/host2` managed hosts.
2. **Modify the shared profiles and host properties to reflect the configuration of the managed hosts to reinstall.**
3. **Reinstall the specified managed hosts.**

```
$ changemgr reinstall [ -u username ] [ -p file ] [ -d domain ] \  
topopath ...
```

topopath Specifies the path to a managed host or host group. The managed host or host group is relative to the top of the specified administrative domain.

For descriptions of the other options, see “How to Add Managed Hosts (Command Line)” on page 89.

Example—Reinstalling Managed Hosts

Suzi reinstalls the /web-server/host1 and /web-server/host2 managed hosts.

```
$ changemgr reinstall /web-server/host1 /web-server/host2
```

▼ How to Update Managed Hosts (Command Line)

Note – First use the Change Manager to perform an initial installation before using the *Solaris Live Upgrade* feature on a managed host. The initial installation creates two *boot environments*.

1. Determine which managed hosts you want to update.

For example, update the /web-server/host1 and /web-server/host2 managed hosts.

2. Modify the shared profiles and host properties to reflect the configuration of the managed hosts to update.

3. Update the specified managed hosts.

```
$ changemgr update [ -u username ] [ -p file ] [ -d domain ] \  
[ -x operation ] topopath ...
```

-x operation Specify the action to take after the update completes. If *operation* is *reboot*, then activate the newly installed software stack and reboot. If *operation* is *halt*, then activate the newly installed software stack and halt. The default operation is to reboot.

topopath Specifies the path to a managed host or host group. The managed host or host group is relative to the top of the specified administrative domain.

For descriptions of the other options, see “How to Add Managed Hosts (Command Line)” on page 89.

Example—Updating Managed Hosts

Suzi updates the `/web-server/host1` and `/web-server/host2` managed hosts. When the update completes, the managed hosts are rebooted to run the newly updated boot environment.

```
$ changemgr update /web-server/host1 /web-server/host2
```

Example—Updating Managed Hosts and Halting the Managed Hosts When the Update Completes

Suzi updates the `/web-server/host1` and `/web-server/host2` managed hosts. When the update completes, the managed hosts are set up to run the newly updated boot environment. Then, the managed hosts are halted.

```
$ changemgr update -x halt /web-server/host1 \
/web-server/host2
```

▼ How to Fall Back to the Previous Version of the Software Stack (Command Line)

The fallback operation “undoes” the last update attempt of a managed host, whether it finished or did not start.

For example, three managed hosts are updated one at a time. The update completes on the first managed host. Then, the update begins on the second managed host. When the first managed host boots the updated boot environment, you notice that there are problems with the system. You cancel the running update.

Each of the three managed hosts are in a different state. The first managed host completed the update. The second managed host started the update, but did not complete it. The third managed host did not start the update.

The fallback operation ensures that each of these managed hosts reverts to the boot environment running prior to the update attempt.

The fallback feature fails if the system cannot boot. In such cases, see “Solaris Live Upgrade (Overview)” in *Solaris 9 Installation Guide*.

1. **Determine which managed hosts you want to fall back to the previous active boot environment.**

For example, perform the fallback operation on the `/web-server/host1` and `/web-server/host2` managed hosts.

2. **Fall back to the previous version of the software stack.**

```
$ changemgr fallback [ -u username ] [ -p file ] [ -d domain ] \  
topopath ...
```

topopath Specifies the path to a managed host or host group. The managed host or host group is relative to the top of the specified administrative domain.

For descriptions of the other options, see “How to Add Managed Hosts (Command Line)” on page 89.

Example—Getting Managed Hosts to Fall Back to the Previous Active Boot Environment

Suzi wants the /web-server/host1 and /web-server/host2 managed hosts to fall back to the previous active boot environment.

```
$ changemgr fallback /web-server/host1 /web-server/host2
```

▼ How to Reboot Managed Hosts (Command Line)

1. Determine the managed hosts that you want to reboot.

For example, you can reboot the /web-server/host1 and /web-server/host2 managed hosts.

2. Reboot the managed hosts.

```
$ changemgr reboot [ -u username ] [ -p file ] [ -d domain ] \  
topopath ...
```

topopath Specifies the path to a managed host or host group. The managed host or host group is relative to the top of the specified administrative domain.

For descriptions of the other options, see “How to Add Managed Hosts (Command Line)” on page 89.

Example—Rebooting Managed Hosts

Suzi wants to reboot the /web-server/host1 and /web-server/host2 managed hosts.

```
$ changemgr reboot /web-server/host1 /web-server/host2
```

▼ How to Halt Managed Hosts (Command Line)

1. Determine the managed hosts that you want to halt.

For example, you can halt the `/web-server/host1` and `/web-server/host2` managed hosts.

2. Halt the managed hosts.

```
$ changemgr halt [ -u username ] [ -p file ] [ -d domain ] \  
topopath ...
```

topopath Specifies the path to a managed host or host group. The managed host or host group is relative to the top of the specified administrative domain.

For descriptions of the other options, see “How to Add Managed Hosts (Command Line)” on page 89.

Example—Halting Managed Hosts

Suzi wants to halt the `/web-server/host1` and `/web-server/host2` managed hosts.

```
$ changemgr halt /web-server/host1 /web-server/host2
```


Auditing Software Configurations (Tasks)

This chapter provides step-by-step instructions for gathering status about managed hosts.

The following topics are covered in this chapter:

- “Using Audit Software” on page 97
- “Change Manager Audit File Types” on page 98
- “Auditing Software Configurations by Using the Browser Interface (Task Map)” on page 102
- “Auditing Software Configurations by Using the Browser Interface” on page 103
- “Auditing Software Configurations by Using the Command-Line Interface (Task Map)” on page 111
- “Auditing Software Configurations by Using the Command-Line Interface” on page 112

For descriptions of the audit-related file formats, see Chapter 11.

Using Audit Software

The Change Manager provides users with the ability to validate the contents of deployed software stacks. Stack validation is accomplished by comparing the contents of a managed host’s file systems over time with those of a “known good,” or baseline, configuration. The audit features are implemented by using the `bart(1MCM)` command.

The audit rules file enables you to track files and directories on managed hosts that are installed with a *software stack*. The audit tool enables you to determine which files were added to and deleted from managed hosts. You can also use the audit rules file to specify which file attribute changes you want to flag.

When an audit rules file is applied to one or more managed hosts configured with the same software stack, the results should be nearly identical. Note that the properties of some files might change legitimately across installed machines (`/etc/nodename`). Other files should not have properties that change (`/usr/bin/lis`). The author of the audit rules file must ensure that only relevant files are members of the stack definition.

The state of a file is described by the associated file attributes, such as file size, creation date, modification date, and access control list (*ACL*). The state of a file is optionally described by a cryptographic checksum of the files contents and most of the values retrieved by the `stat(2)` system call.

The description of a software stack yields a list of files and associated attributes in a *manifest*. The manifests represent the software stacks on each managed host. Pairs of manifests can be compared to yield a manifest *comparison report*, which lists file-by-file differences.

Review the comparison report to determine whether the two manifests are “similar enough.” Also, the review can determine whether the stack has changed so much as to no longer be valid.

Use the *audit* tool to perform a file-level check of the software contents of a managed host. The Change Manager compares a *baseline manifest* against manifests generated for each managed host selected. The baseline manifest represents a baseline state of the managed host, which might match the original state of the software stack.

- **Build manifests for managed hosts** – Build a manifest for a managed host. The *manifest* is a list of files and associated file attributes for a managed host.
- **Audit managed hosts** – Audit managed hosts by comparing their manifests against a baseline manifest. The output of the comparison is a *comparison report*.
- **Get software status** – Get information about the patches and packages running on the managed host.

Change Manager Audit File Types

The Change Manager uses files as input and output for audit jobs.

You can use folders to create a hierarchy in which to organize these Change Manager files. These files and folders are stored in the repository. You can organize the folders and files in any way that you want.

Access the repository in the browser user interface by clicking the Files tab. Access the repository with the command-line interface by using the file management subcommands of the `changemgr` command.

You might organize the folders and files in the following ways:

- **Group like file types** – For example, store all the Solaris Flash archives in a single folder. Do the same for Solaris boot images, shared profiles, and manifests.
- **Group files related to a particular set of managed hosts** – Create a folder to hold all the files associated with a particular service’s servers.
For example, a *server farm* provides web services. Therefore, create a folder named `WebServer`. In the `WebServer` folder, store the files used by the web server, such as the archives, boot images, shared profiles, and manifests. Create a separate folder to hold files associated with a mail server.
- **Group by user name** – Store all files in folders owned by specific users. For example, store all of Joe’s files in a folder named `joe`. Then, Joe can organize his folders and files in the way he wants.
- **Group all files associated with a particular archive** – Store all files associated with each archive in folders. For example, the archive and associated files for the Apache web server are stored in a folder named `apache-web-server`. Store the archive, boot image, and shared profile in the same folder.

Files stored in the Change Manager repository have a standard set of properties associated with them. The following properties are shared by all files:

Description	User-supplied string that describes the file.
Owner	Read-only property that names the owner of the file.
State	Read-only property that indicates the state of the file.

Note – When using the browser interface, you must perform the operations on the File Actions drop-down menu while in the appropriate folder.

For example, to create a folder inside an existing folder, go to that folder *before* choosing New Folder from the File Actions menu.

When using the browser interface, you can select items from a list. To select an item from a list, click the checkbox next to the item name. Then, choose the action to perform from the File Actions drop-down menu.

Audit Rules File

An *audit rules file* determines what files and file attributes to audit on a managed host. The audit rules file serves two purposes:

- To specify which files and directories to catalog when building a manifest for a managed host
- To specify which files, directories, and file attributes in the manifests to compare when auditing managed hosts

For example, you might want to ignore the directory modification time for files. The modification time changes each time a file is created or deleted in the directory. You might also want to ignore `core` files or `.o` files.

The format of the audit rules file is described in “Audit Rules File Format” on page 177. The audit rules file name must use the `.brul` suffix.

To create or import a rules file from another system, see “How to Create an Audit Rules File (Web Browser)” on page 103 and “How to Import an Audit Rules File to the Change Manager Repository (Web Browser)” on page 104 or “How to Import Audit Rules Files to the Change Manager Repository (Command Line)” on page 112.

To build manifests of managed hosts, see “How to Build Manifests for Managed Hosts (Web Browser)” on page 107 or “How to Build Manifests for Managed Hosts (Command Line)” on page 116.

To audit managed hosts, see “How to Audit Managed Hosts (Web Browser)” on page 108 or “How to Audit Managed Hosts (Command Line)” on page 117.

To import a manifest to the repository, see “How to Import a Manifest to the Change Manager Repository (Web Browser)” on page 104 or “How to Import Manifests to the Change Manager Repository (Command Line)” on page 113.

Manifest

A *manifest* is a file that describes all the files on the managed host and the file attributes for each file. The audit feature uses this manifest to determine how the managed host’s software has changed over time. The files described in the manifest are based on the audit rules.

The format of a manifest is described in the “Manifest File Format” on page 181. The manifest is output for the Build Manifests action or the `changemgr manifest` command. The manifest can be used as input for the Audit action or `changemgr audit` command. The manifest file name must use the `.bmft` suffix.

In addition to the general file properties, a manifest is associated with the following property:

RulesFile	Read-only property that names the audit rules file used to build the manifest.
-----------	--

To import an existing manifest to the Change Manager repository, see “How to Import a Manifest to the Change Manager Repository (Web Browser)” on page 104 or “How to Import Manifests to the Change Manager Repository (Command Line)” on page 113.

To build manifests of managed hosts, see “How to Build Manifests for Managed Hosts (Web Browser)” on page 107 or “How to Build Manifests for Managed Hosts (Command Line)” on page 116.

To audit managed hosts, see “How to Audit Managed Hosts (Web Browser)” on page 108 or “How to Audit Managed Hosts (Command Line)” on page 117.

Report

A *report* is a file that is created by two jobs: Audit and Get Software Status. See “How to Audit Managed Hosts (Web Browser)” on page 108 or “How to Audit Managed Hosts (Command Line)” on page 117 and “How to Get the Software Status of Managed Hosts (Web Browser)” on page 109 or “How to Get the Software Status of Managed Hosts (Command Line)” on page 118.

See a description of the “Comparison Report Format” on page 184.

The report file name must use the `.txt` suffix.

Folder

A *folder* is a container that can hold files and other folders. Click a folder name to go into that folder. Then, view the folder’s contents. Change Manager files can be the following:

- Solaris Flash archive
- Solaris boot image
- Shared profile
- Manifest
- Audit rules file
- Report

Perform the following actions from the folder page:

- Create folders, shared profiles, and audit rules files.
- Import Solaris Flash archives, Solaris boot images, shared profiles, audit rules files, and manifests to the Change Manager repository.
- Rename folders and files.
- Export files.
- Create a copy of a shared profile or an audit rules file in the current folder.
- Move folders and files to another folder.
- Delete folders and files.

To create folders, see “How to Create a Folder (Web Browser)” on page 134 or “How to Create a Folder (Command Line)” on page 139.

Auditing Software Configurations by Using the Browser Interface (Task Map)

The following table identifies the procedures you need to audit managed hosts.

Task	Description	For Instructions
Create an audit rules file.	Create an audit rules file to determine which files and directories to list in the manifest.	See “How to Create an Audit Rules File (Web Browser)” on page 103.
Import an audit rules file to the Change Manager repository.	Import an existing audit rules file to the Change Manager repository.	See “How to Import an Audit Rules File to the Change Manager Repository (Web Browser)” on page 104.
Import manifests to the Change Manager repository.	Import existing manifests to the Change Manager repository. These manifests can be used in comparisons.	See “How to Import a Manifest to the Change Manager Repository (Web Browser)” on page 104.
Add a managed host.	Add a managed host in your administrative domain.	See “How to Add a Managed Host (Web Browser)” on page 105.
Build manifests for managed hosts.	Build manifests for managed hosts. Each manifest includes a list of entries, one per file cataloged. Each file entry includes the file name and several file attribute values.	See “How to Build Manifests for Managed Hosts (Web Browser)” on page 107.
Audit managed hosts.	Audit managed hosts by comparing them against a baseline manifest. The existence of files, as well as file attribute values are compared.	See “How to Audit Managed Hosts (Web Browser)” on page 108.
Get software status of managed hosts.	Get information about the packages and patches installed on the managed hosts.	See “How to Get the Software Status of Managed Hosts (Web Browser)” on page 109.

Auditing Software Configurations by Using the Browser Interface

This section describes how to use the browser interface to audit managed hosts.

To learn how to create folders and perform management tasks in the Change Manager repository, see Chapter 8. None of the procedures described in Chapter 8 are required to perform audit tasks, though you might want to create a hierarchy of folders in the repository.

To learn how to create host groups and perform management tasks on the Change Manager topology, see Chapter 9. None of the procedures described in Chapter 9 are required to perform audit tasks, though you might want to create a hierarchy of host groups in the topology.

To learn how to navigate through the browser interface, see Appendix A.

▼ How to Access the Files Section and Appropriate Folder (Web Browser)

Note that the top of the Files section hierarchy is a folder.

1. **To go to the Files section, click the Files tab in the general links area at the top of the page.**

The top-level Files page shows a table, which can contain files and folders. The table is a file manager.

2. **Drill down to the appropriate folder.**

Click a folder name to go into that folder. Then, view the folder's contents. Continue to click folder names until you reach the folder or file you want.

▼ How to Create an Audit Rules File (Web Browser)

You create an audit rules file so that you can do the following:

- Build a manifest for a managed host
 - Audit managed hosts by comparing manifests against a baseline manifest
1. **If you are not already in the appropriate folder, see “How to Access the Files Section and Appropriate Folder (Web Browser)” on page 103.**
 2. **From the File Actions menu, choose New Audit Rules.**

3. Supply the following information:

- Choose a meaningful audit rules file name. For example, choose a name that describes the rules, `usr-only`. Add the `.brul` suffix to complete the audit rules file name, `usr-only.brul`.
- Customize the sample rules in the Contents field. For more information about creating the rules file, see “Audit Rules File Format” on page 177.

4. When the audit rules are complete, click Save to create the audit rules file.

Click Cancel to return to the previous page.

▼ How to Import an Audit Rules File to the Change Manager Repository (Web Browser)

Import an audit rules file to the Change Manager repository. The audit rules file is used to build manifests and audit managed hosts.

The time required to import a file to the Change Manager repository depends on the size of the file and the speed of the network.

1. If you are not already in the appropriate folder, see “How to Access the Files Section and Appropriate Folder (Web Browser)” on page 103.

2. From the File Actions menu, choose Import Audit Rules.

3. Supply the following information:

- Choose a meaningful audit rules file name. For example, choose a name that describes the type of rules or audit coverage, such as `usr-only`. Add the `.brul` suffix to complete the audit rules file name, `usr-only.brul`.
- Path name of the rules file to import. Click Browse to find the rules file.

4. When the information is complete, click Import to copy the rules file to the Change Manager repository.

Click Cancel to return to the previous page.

▼ How to Import a Manifest to the Change Manager Repository (Web Browser)

The manifests are created by the Build Manifests command.

The time required to import a file to the Change Manager repository depends on the size of the file and the speed of the network.

1. If you are not already in the appropriate folder, see “How to Access the Files Section and Appropriate Folder (Web Browser)” on page 103.

2. From the File Actions menu, choose **Import Manifest**.
3. **Supply the following information:**
 - Manifest name. Choose a meaningful name. For example, choose a name that describes the audit rules used, the managed host's name, and the date and time of the audit. Add the `.bmft` suffix to complete the manifest name, `usr-only.host12.may122002.bmft`.
 - Path name to the manifest file to import. Click Browse to find the manifest.
4. **When the information is complete, click Import to copy the manifest to the Change Manager repository.**
Click Cancel to return to the previous page.

▼ How to Access the Hosts Section and Appropriate Administrative Domain and Host Group (Web Browser)

1. **To go to the Hosts section, click the Hosts tab in the general links area at the top of the page.**
 - If more than one administrative domain exists, you go to a page showing a table that lists the available administrative domains. Go to Step 2.
 - If only one administrative domain exists, the page shows a table that lists managed hosts and host groups in the default domain. Go to Step 3.
2. **(Optional) Click the name of the administrative domain to use.**

Note – Use Sun Management Center to create a new administrative domain. See “Using Sun Management Center Administrative Domains” in *Sun Management Center 3.0 Software User's Guide*.

3. **Drill down to the appropriate host group.**
Click a host group name to go into that host group. Then, view the host group's contents. Continue to click host group names until you reach the host group or managed host you want.

▼ How to Add a Managed Host (Web Browser)

Managed host properties are the same as those specified for shared profiles. For information about the properties and property values, see Chapter 10.

Note – A managed host can be a client of only *one* Change Manager server. To change control of a managed host to another Change Manager server, see “Internal error: unable to establish probe connection Appears When Running Jobs on Managed Hosts” on page 197.

1. **If you are not already in the appropriate host group, see “How to Access the Hosts Section and Appropriate Administrative Domain and Host Group (Web Browser)” on page 105.**

2. **From the Host Actions menu, choose Add Host.**

The host property page appears.

3. **Supply the following information:**

- Host name.
- Ethernet address of the managed host.
- *Platform group* of the managed host.
- Port number configured on the agent to communicate with the server.

Note – If you change the value of this property after installing a managed host, the Change Manager server will no longer be able to communicate with it. To reestablish communication with the server by using the new agent port, you must re-initialize the managed host by performing an initial installation on it.

- Shared profile to use to install or update the managed host.
- Parameter values that customize the Solaris Flash archive for the managed host.

Note – If a shared profile already exists for this managed host, you only need to specify the name of the shared profile. You can override any archive-specific parameter values specified in the shared profile by clicking the Load button. Then, you can update these parameter value fields on the host properties page.

4. **Click Add to add the managed host.**

Click Cancel to return to the previous page.

▼ How to Build Manifests for Managed Hosts (Web Browser)

1. **If you are not already in the appropriate host group, see “How to Access the Hosts Section and Appropriate Administrative Domain and Host Group (Web Browser)” on page 105.**
2. **Select the managed hosts and host groups for which you want to build manifests.**
For example, select `host1` and `host2` by clicking the checkbox next to `host1` and `host2`.
3. **From the Host Actions menu, choose Build Manifests.**
4. **Supply a meaningful job name.**
For example, the job name might be `Build manifests for host1 and host2`.
5. **Determine when you want to run the job, either now or at another time.**
 - To initiate the job immediately, click the Start Now radio button.
 - Run the job at a later time by specifying the start date and start time.
 - Start date. Click the date or specify the date in the *mm/dd/yyyy* format.
mm and *dd* are two-digit forms for the month and day. *yyyy* is the four-digit form for the year.
 - Start time. Choose the start time from the hour and minute pull-down menus.
6. **Specify the path name of the audit rules file to use.**
Click Browse to open a file chooser to help in the search for the audit rules file in the Change Manager repository.
To add an audit rules file to the Change Manager repository, see “How to Create an Audit Rules File (Web Browser)” on page 103 and “How to Import an Audit Rules File to the Change Manager Repository (Web Browser)” on page 104. See the description of the “Audit Rules File Format” on page 177.
For example, the audit rules file is `/files/web-server/usr-only.brul`.
7. **Specify the path name of the folder in which to store the manifest.**
For example, store the resulting manifests in the `/files/web-server` folder.
8. **Supply the prefix for the manifest file name.**
The prefix helps identify the manifest.
For example, the prefix name might be `usr-only` to indicate the rules file used to generate the manifests. The resulting manifest file name for `host1` might look like `usr-onlyhost1.brul`.
9. **Click Submit to build the manifests, or click Cancel to return to the previous page.**
This operation takes some time to complete.

10. When the operation completes, view the manifests.

- a. Click the Files tab at the top of the web page to go to the Files section.**
- b. Drill down to the folder where you stored the manifests.**
- c. Click the manifest name to go to its property page.**

You can view one manifest at a time.

If the manifest is very large, use the Prev and Next buttons to navigate between pages.

- d. To return to the folder that holds the manifests, click Back.**

Repeat Steps 10c and 10d to view more manifests.

For example, Suzi can schedule a job to build manifests for the `/hosts/web-server/apache/host1` and `/hosts/web-server/apache/host2` managed hosts. The manifests will be stored in the `/files/web-server` folder. Each file name will use `usr-only` as the prefix. The audit rules file to be used is called `/files/web-server/usr-only.brul`. The operation is scheduled to start on June 27th at 3:00 a.m.

▼ How to Audit Managed Hosts (Web Browser)

Audit managed hosts by comparing them to a baseline manifest.

- 1. If you are not already in the appropriate host group, see “How to Access the Hosts Section and Appropriate Administrative Domain and Host Group (Web Browser)” on page 105.**
- 2. Select the managed hosts and host groups to compare.**

For example, select `host1` and `host2` by clicking the checkbox next to `host1` and `host2`.
- 3. From the Host Actions menu, choose Audit.**
- 4. Supply a meaningful job name.**

For example, the job name might be `Compare host1 and host2`.
- 5. Determine when you want to run the job, either now or at another time.**
 - To initiate the job immediately, click the Start Now radio button.
 - Run the job at a later time by specifying the start date and start time.
 - Start date. Click the date or specify the date in the `mm/dd/yyyy` format.
mm and *dd* are two-digit forms for the month and day. *yyyy* is the four-digit form for the year.
 - Start time. Choose the start time from the hour and minute pull-down menus.

6. Specify the path name of the audit rules file to use.

Click Browse to open a file chooser to help in the search for the audit rules file in the Change Manager repository.

To add an audit rules file to the Change Manager repository, see “How to Create an Audit Rules File (Web Browser)” on page 103 and “How to Import an Audit Rules File to the Change Manager Repository (Web Browser)” on page 104. See the description of the “Audit Rules File Format” on page 177.

For example, the audit rules file is `/files/web-server/usr-only.brul`.

7. To specify the baseline manifest, do one of the following:

- Specify the path name of the baseline manifest.
- Click Browse to find the baseline manifest.

For example, the baseline manifest is `/files/web-server/usr-only.baseline.bmft`.

8. To specify the report file, do one of the following:

- Specify the path name of the report file.
- Click Browse to choose the report file in which to store the results.

For example, the report file is stored in `/files/web-server/host1-host2.usr-only.compare.txt`.

9. Click Submit to initiate the manifest comparison, or click Cancel to return to the previous page.

The compare operation takes some time to complete.

10. When the operation completes, view the generated comparison reports.

a. Click the Files tab at the top of the web page to go to the Files section.

b. Drill down to the folder where you stored the comparison reports.

c. Click the comparison report name to go to the property page.

You can view one comparison report at a time.

If the comparison report is very large, use the Prev and Next buttons to navigate between pages.

d. To return to the folder that holds the comparison reports, click Back.

Repeat Steps 10c and 10d to view more comparison reports.

▼ How to Get the Software Status of Managed Hosts (Web Browser)

1. If you are not already in the appropriate host group, see “How to Access the Hosts Section and Appropriate Administrative Domain and Host Group (Web Browser)”

on page 105.

2. Select the managed hosts and host groups for which you want to get the software status.

For example, select host1 and host2 by clicking the checkbox next to host1 and host2.

3. From the Host Actions menu, choose Get Software Status.

4. Supply a meaningful job name.

For example, the job name might be Get Software Status for host1 and host2.

5. Determine when you want to run the job, either now or at another time.

- To initiate the job immediately, click the Start Now radio button.
- Run the job at a later time by specifying the start date and start time.
 - Start date. Click the date or specify the date in the *mm/dd/yyyy* format. *mm* and *dd* are two-digit forms for the month and day. *yyyy* is the four-digit form for the year.
 - Start time. Choose the start time from the hour and minute pull-down menus.

6. To specify the report file, do one of the following:

- Specify the path name of the report file.
- Click Browse to choose the report file in which to store the results.

For example, the report file is stored in `/files/web-server/host1-host2.software.status.txt`.

7. Click Submit to get the software status, or click Cancel to return to the previous page.

The software status operation takes some time to complete.

8. When the operation completes, view the generated software status reports.

a. Go to the Files section.

Click the Files tab at the top of the page.

b. Drill down to the folder where you stored the software status reports.

c. Click the name of the software status report to go to the property page.

You can view one software status report at a time.

If the software status report is very large, use the Prev and Next buttons to navigate between pages.

d. To return to the folder that holds the software status reports, click Back.

Repeat Steps 8c and 8d to view more software status reports.

Auditing Software Configurations by Using the Command-Line Interface (Task Map)

The following table identifies the procedures you need to audit managed hosts. See the `changemgr(1MCM)` man page.

Task	Description	For Instructions
Import an audit rules file to the Change Manager repository.	Import an existing audit rules file to the Change Manager repository.	See “How to Import Audit Rules Files to the Change Manager Repository (Command Line)” on page 112.
Import manifests to the Change Manager repository.	Import existing manifests to the Change Manager repository. These manifests can be used in comparisons.	See “How to Import Manifests to the Change Manager Repository (Command Line)” on page 113.
Add a managed host.	Add a managed host in your administrative domain.	See “How to Add Managed Hosts (Command Line)” on page 115.
Build manifests for managed hosts.	Build manifests for managed hosts. Each manifest includes a list of entries, one per file cataloged. Each file entry includes the file name and several file attribute values.	See “How to Build Manifests for Managed Hosts (Command Line)” on page 116.
Audit managed hosts.	Audit managed hosts by comparing them against a baseline manifest. The existence of files, as well as file attribute values are compared.	See “How to Audit Managed Hosts (Command Line)” on page 117.
Get software status of managed hosts.	Get information about the packages and patches installed on the managed hosts.	See “How to Get the Software Status of Managed Hosts (Command Line)” on page 118.

Auditing Software Configurations by Using the Command-Line Interface

This section describes how to use the command-line interface to audit managed hosts.

To learn how to create folders and perform management tasks in the Change Manager repository, see Chapter 8. None of the procedures described in Chapter 8 are required to perform audit tasks, though you might want to create a hierarchy of folders in the repository.

To learn how to create host groups and perform management tasks on the Change Manager topology, see Chapter 9. None of the procedures described in Chapter 9 are required to perform audit tasks, though you might want to create a hierarchy of host groups in the topology.

▼ How to Import Audit Rules Files to the Change Manager Repository (Command Line)

The audit rules file is used to build manifests and audit managed hosts.

The time required to import a file to the Change Manager repository depends on the size of the file and the speed of the network.

1. Determine where the audit rules file exists and where to store it.

For example, copy the audit rules file from `/net/test1/home/suzi/usr-only.brul` to the `web-server` folder.

2. Import an audit rules file to the Change Manager repository by using one of these `changemgr import` commands.

- The following command line imports one file at a time. You can also use this command line to rename the file.

```
$ changemgr import [ -u username ] [ -p file ] filepath[.type] \
relfilepath.type
```

- The following command line imports several files to a folder simultaneously.

```
$ changemgr import [ -u username ] [ -p file ] filepath.type ... \
reldirpath
```

`-u username` Specify the user name to authenticate. If this option is not specified, the user is the current UNIX user.

`-p file` *file* consists of a single line, which contains the password. If *file* is `-`, then the user can supply the password as standard input.

	If the <code>-p</code> option is not supplied, then the <code>changemgr</code> command prompts the user for his password.
<i>filepath</i>	Specifies an absolute or relative path to a file. This file path is not within the Change Manager repository.
<i>reldirpath</i>	Specifies the path to a folder that is relative to the top of the Change Manager repository.
<i>relfilepath</i>	Specifies the path to a file, <i>not</i> including a folder, that is relative to the top of the Change Manager repository.
<i>.type</i>	Specifies the file name suffix that represents the file type. An audit rules file uses the <code>.brul</code> suffix.

Choose a name that indicates the type of audit specified by the audit rules file. Use the `.brul` suffix. For example, create an audit rules file named `usr-only.brul`, which indicates that only files from `/usr` are cataloged.

Example—Importing an Audit Rules File to the Change Manager Repository

Suzi copies the audit rules file called `/net/test1/home/suzi/usr-only.brul` to the `web-server` folder of the repository. She renames the file to be `usr_only.brul`.

```
$ changemgr import /net/test1/home/suzi/usr-only.brul \
/web-server/usr_only.brul
```

Example—Importing Audit Rules Files to the Change Manager Repository

Suzi copies the audit rules files called `/net/test1/home/suzi/usr-only.brul` and `/net/test1/home/suzi/opt-only.brul` to the `/` folder of the repository.

```
$ changemgr import /net/test1/home/suzi/usr-only.brul \
/net/test1/home/suzi/opt-only.brul /
```

▼ How to Import Manifests to the Change Manager Repository (Command Line)

The manifests are created by the `changemgr manifest` command, which performs a per-file audit of a managed host.

The time required to import a file to the Change Manager repository depends on the size of the file and the speed of the network.

1. Determine where the manifest exists and where to store it.

For example, copy the manifest from `/net/test1/home/suzi/host1-usr-only.bmft` to the web-server folder.

2. Import a manifest to the Change Manager repository by using one of these `changemgr import` commands.

- The following command line imports one file at a time. You can also use this command line to rename the file.

```
$ changemgr import [ -u username ] [ -p file ] filepath[.type] \
relfilepath.type
```

- The following command line imports several files to a folder simultaneously.

```
$ changemgr import [ -u username ] [ -p file ] filepath.type ... \
reldirpath
```

For descriptions of the options, see “How to Import Audit Rules Files to the Change Manager Repository (Command Line)” on page 112.

Choose a name that indicates the name of the audited managed host and the type of audit specified by the audit rules file. Use the `.bmft` file suffix. For example, copy a manifest named `host1-usr-only.bmft`, which indicates that only files from `/usr` are cataloged for the `host1` managed host.

Example—Importing a Manifest to the Change Manager Repository

Suzi copies the manifest called `/net/test1/home/suzi/host1-usr-only.bmft` to the web-server folder. She renames the file to be `host1_usr_only.bmft`.

```
$ changemgr import \
/net/test1/home/suzi/host1-usr-only.bmft \
/web-server/host1_usr_only.bmft
```

Example—Importing Manifests to the Change Manager Repository

Suzi copies the manifests called `/net/test1/home/suzi/host1-usr-only.bmft` and `/net/test1/home/suzi/host1-opt-only.bmft` to the `/` folder.

```
$ changemgr import \
/net/test1/home/suzi/host1-usr-only.bmft \
/net/test1/home/suzi/host1-opt-only.bmft /
```

▼ How to Add Managed Hosts (Command Line)

To simplify naming of managed hosts, you can make each name match the name of the actual machine.

Note – If you change the value of the `AgentPort` property after installing a managed host, the Change Manager server will no longer be able to communicate with it. To reestablish communication with the server by using the new agent port, you must re-initialize the managed host by performing an initial installation on it.

Note – A managed host can be a client of only *one* Change Manager server. To change control of a managed host to another Change Manager server, see “Internal error: unable to establish probe connection Appears When Running Jobs on Managed Hosts” on page 197.

1. Determine where to create the managed host.

For example, create a managed host in the `web-server` host group.

2. Use one of the following `changemgr add` commands to add the managed host.

- This command adds a managed host to be controlled by the Change Manager. A managed host can be created in a host group that is part of the Change Manager topology. *hostpath* is the full path name or relative path name to the managed host, which includes the host group hierarchy.

```
$ changemgr add [ -u username ] [ -p file ] [ -d domain ] \  
hostname hostpath
```

- This command adds the specified hosts to the specified host group. The topology names are the same as the host names.

```
$ changemgr add [ -u username ] [ -p file ] [ -d domain ] \  
hostname ... groupname
```

`-u username` Specify the user name to authenticate. If this option is not specified, the user is the current UNIX user.

`-p file` *file* consists of a single line, which contains the password. If *file* is `-`, then the user can supply the password as standard input.

If the `-p` option is not supplied, then the `changemgr` command prompts the user for his password.

<code>-d domain</code>	Specify the administrative domain on which to operate. In the context of a session, the default is the domain specified for the session. If no domain is specified, <i>domain</i> is the user's home domain. By default, <i>domain</i> is the user's home domain.
<code>hostname</code>	Specifies the network name of a host, for example, <code>host1.yourcompany.com</code> .
<code>hostpath</code>	Specifies the path to a managed host that is relative to the top of the selected administrative domain.
<code>grouppath</code>	Specifies the path to a host group that is relative to the top of the selected administrative domain.

Example—Adding a Managed Host

Chris creates the `host1` managed host in the `web-server/apache` host group.

```
$ changemgr add host1 /web-server/apache
```

Example—Adding a Managed Host and Changing Its Name

Chris adds the `host1` managed host to the `web-server/apache` host group and changes the host name to `Host1`.

```
$ changemgr add host1 /web-server/apache/Host1
```

Example—Adding Managed Hosts to a Host Group

Chris adds the `host1` and `host2` managed hosts to the `web-server/apache` host group.

```
$ changemgr add host1 host2 /web-server/apache
```

▼ How to Build Manifests for Managed Hosts (Command Line)

1. Determine which managed hosts you want to audit.

For example, audit the `/web-server/host1` and `/web-server/host2` managed hosts.

2. Build manifests for the managed hosts.

```
$ changemgr manifest [ -u username ] [ -p file ] [ -d domain ] \
-o relfilepathprefix [ -r relfilepath.brul ] topopath ...
```

-o relfilepathprefix Specify the prefix to be used when creating the output inventories. The name of the managed host and the .bmft suffix are appended to the prefix specified to form the name of the resulting manifest.

-r relfilepath.brul Specify the audit rules file to use to create the manifest.

topopath Specifies the path to a managed host or host group that is relative to the top of the selected administrative domain.

For descriptions of the other options, see “How to Add Managed Hosts (Command Line)” on page 115.

Example—Building Manifests for Managed Hosts

Suzi builds manifests for the /web-server/host1 and /web-server/host2 managed hosts. She stores the files in the /web-server folder with a manifest file prefix of usr-only. The resulting file names are /web-server/host1.bmft and /web-server/host2.bmft.

```
$ changemgr manifest -o /web-server/ -r usr-only.brul \
/web-server/host1 /web-server/host2
```

Note – If the argument to -o is a folder, terminate the argument with a slash. For example, if the argument to -o is /web-server/baseline, then baseline is prefixed to manifests created in the /web-server folder. Using this prefix, a resulting manifest name might be /web-server/baselinehost1.bmft.

▼ How to Audit Managed Hosts (Command Line)

The baseline manifest does not need to be built on the managed host. You can build a baseline manifest on a master system before creating the Solaris Flash archive.

1. Determine which managed hosts you want to audit.

For example, audit the /web-server/host1 and /web-server/host2 managed hosts.

2. Audit managed hosts.

```
$ changemgr audit [ -u username ] [ -p file ] [ -d domain ] \
-o relfilepath.txt [ -r relfilepath.brul ] relfilepath.bmft topopath ...
```

-o relfilepath.txt Specify where to write the report on manifest differences.

<code>-r relfilepath.brul</code>	Specify the audit rules file to use to create the manifest.
<code>relfilepath.bmft</code>	Specifies the path to the manifest file that is relative to the top of the Change Manager repository.
<code>topopath</code>	Specifies the path to a managed host or host group that is relative to the top of the selected administrative domain.

For descriptions of the other options, see “How to Add Managed Hosts (Command Line)” on page 115.

Example—Auditing Managed Hosts

Suzi audits the `/web-server/host1` managed host. She stores the report in the `/web-server/usr-only.txt` file. She audits the managed host by comparing its manifest against the baseline manifest called `/web-server/baseline.bmft`.

```
$ changemgr audit suzi \
-o /web-server/usr-only.txt -r usr-only.brul \
/web-server/baseline.bmft /web-server/host1
```

To understand how to interpret the report results, see “Comparison Report Format” on page 184.

▼ How to Get the Software Status of Managed Hosts (Command Line)

1. Determine the managed hosts for which you want to get the software status.

For example, get the software status for the `/web-server/host1` and `/web-server/host2` managed hosts.

2. Get the software status for a managed host.

```
$ changemgr info [ -u username ] [ -p file ] [ -d domain ] \
-o relfilepath.txt topopath ...
```

<code>-o relfilepath.txt</code>	Specify the path of the file that contains the software status report.
---------------------------------	--

<code>topopath</code>	Specifies the path to a managed host or host group that is relative to the top of the selected administrative domain.
-----------------------	---

For descriptions of the other options, see “How to Add Managed Hosts (Command Line)” on page 115.

Example—Getting the Software Status of Managed Hosts

Suzi gets the software status for the `/web-server/host1` managed host. She stores the report in the `/web-server/software-status.txt` file.

```
$ changemgr info -o /web-server/software-status.txt \  
/web-server/host1
```


Monitoring Jobs (Tasks)

Use the Change Manager to initiate jobs to run on managed hosts, such as installation or audit. Also, use the Change Manager to initiate jobs to run on the Change Manager server, such as import or export. Then, use the job log and job queue to get status about jobs that you created from the Hosts and Files sections.

The following topics are described in this chapter:

- “Job Queue and Logs” on page 121
- “Monitoring Jobs by Using the Browser Interface (Task Map)” on page 123
- “Monitoring Jobs by Using the Browser Interface” on page 124
- “Monitoring Jobs by Using the Command-Line Interface (Task Map)” on page 127
- “Monitoring Jobs by Using the Command-Line Interface” on page 127

Job Queue and Logs

A *job* is described by a job name and a unique *job ID* that the Change Manager generates.

You can perform the following actions on jobs:

- View the status of submitted jobs
- Cancel running jobs
- *Purge* the completed jobs from the job queue

Job Queue

From the Jobs page, view the *job queue* to monitor current and recent pending, running, and completed jobs. Jobs are initiated on the Change Manager server to perform several tasks, such as installing a managed host. Initiate the jobs from the Hosts section. Then, check the status of the jobs from the Jobs section. There are several job status values:

Canceled	Job that has been terminated.
Cancelling	Job that is in the process of being terminated.
Complete	Job that successfully completed.
Failed	Job that failed to complete successfully. See the job log for failure details.
Pending	Job that is scheduled to run, but the start time has not arrived.
Running	Job that is currently running.

Job queue entries include the following information:

Job ID	The unique generated ID of the job.
Job Name	User-supplied name for the job.
User	The user who initiated the command.
Start Time	The time the job started.
End Time	The time the job completed.
Status	The status of the job.

Job Log

From the Logs page, view the *job log* to see detailed information about the progress of jobs. A log entry is created to show each change to the job status. The entry includes the following information:

Date/Time	Time the job starts or completes.
Job ID	The unique generated ID of the job.
Command	The command being run.
Host	The managed host on which the job is initiated.
Status	The status of the job, which indicates whether the job has started or completed.
Message	The status of the job. This field indicates that the job has been submitted or dispatched. If the job fails, this field shows the failure

message.

Transaction Log

From the Logs page, view the transaction log. The transaction log shows the actions that have been initiated from the Change Manager server. This log shows all actions, not just the long-running jobs included in the job log. Each log entry includes the following information:

Date/Time	Time the job starts or completes.
User	The user who initiated the command.
Operation	The operation being run.
Object Type	The type of object being used by the operation.
Message	Status of the job. This field indicates that the job succeeded or failed. If the job fails, an error message is included with the status.

Monitoring Jobs by Using the Browser Interface (Task Map)

The following table identifies the procedures you need to monitor jobs by using the web browser.

Task	Description	For Instructions
View the job queue.	View the job queue to monitor current and recent pending jobs, running jobs, and completed jobs.	See "How to View the Job Queue (Web Browser)" on page 124.
Cancel jobs.	Cancel running jobs and pending jobs that appear in the job queue.	See "How to Cancel Jobs (Web Browser)" on page 124.
Reschedule running jobs.	Reschedule a running job to run at a different time.	See "How to Reschedule a Running Job (Web Browser)" on page 125.

Task	Description	For Instructions
Purge completed jobs from the job queue.	Purge completed jobs from the job queue. Running jobs and pending jobs are not affected.	See “How to Purge Completed Jobs From the Job Queue (Web Browser)” on page 126.
View the job log.	View the job log to see detailed information about the progress of jobs.	See “How to View the Job Log (Web Browser)” on page 126.
View the transaction log.	View the transaction log to see the Change Manager transactions.	See “How to View the Transaction Log (Web Browser)” on page 126.

Monitoring Jobs by Using the Browser Interface

The following procedures describe how to monitor jobs by using the job queue. In addition to viewing the job queue, you can purge completed jobs from the queue and cancel jobs from the queue. Other procedures describe how to view the job log and the transaction log.

▼ How to View the Job Queue (Web Browser)

1. Click the **Jobs** tab to view the job queue.
2. Click the job ID to view job details and possible error messages.

▼ How to Cancel Jobs (Web Browser)

Some Change Manager operations are interrupted when you cancel them and some are not.

When a cancel is issued for an *interruptable* job, the operation currently running on the managed hosts is immediately terminated. The job is canceled for any managed hosts waiting to run the job. The following operations *can* be interrupted:

- Audit
- Build Manifests
- Export

- Get Software Status
- Import

When a cancel is issued for an *uninterruptable* job, the operation currently running on the managed hosts completes. The job is canceled for any managed hosts waiting to run the job. The following operations *cannot* be interrupted:

- Fall Back
- Reboot
- Reinstall
- Set Up for Install
- Update

1. **Click the Jobs tab to go to the Jobs section.**
2. **Click the checkbox next to the job entries of pending jobs or running jobs to cancel.**
3. **Click Cancel Job.**
The Cancel Jobs page shows the list of the selected jobs.
4. **Click Yes, Cancel the Job to cancel the selected jobs and return to the job queue.**
An *alert* appears above the table of job entries, indicating the success or failure of the cancel action.
Click No, Do Not Cancel Job to return to the job queue.
The selected jobs are not canceled.

▼ How to Reschedule a Running Job (Web Browser)

1. **Click the Jobs tab to go to the Jobs section.**
2. **Select the entry of the running job to reschedule.**
3. **Click Cancel Job, then click Yes, Cancel the Job on the Cancel Jobs page.**
4. **Click the Hosts tab to go to the Hosts section.**
5. **Drill down to the host group where the host groups or managed hosts exist.**
6. **Select the host groups or managed hosts on which to schedule the job.**
7. **Choose the action from the Host Actions drop-down menu.**
Supply any input information or output information, as well as the date and time to run the job.
8. **Click Submit to schedule the job.**
An alert appears above the table of host groups and managed hosts, indicating the success or failure of the action initiation.
Click Cancel to return to the host group page.

The job is not initiated.

▼ How to Purge Completed Jobs From the Job Queue (Web Browser)

1. **Click the Jobs tab to go to the Jobs section.**
2. **Click the checkbox next to the job entries of completed jobs to purge from the job queue.**
Completed jobs have status of Canceled, Complete, or Failed.
3. **Click Purge Completed Jobs.**
The Cancel Jobs page shows the list of completed jobs to purge from the job queue.
4. **Click Purge to purge the selected jobs and return to the job queue.**
An alert appears above the table of job entries, indicating the success or failure of the purge action.
Click Cancel to return to the job queue.
The selected jobs are not purged from the job queue.

▼ How to View the Job Log (Web Browser)

1. **Click the Logs tab to go to the Logs section.**
2. **From the View menu, choose Job Log.**

▼ How to View the Transaction Log (Web Browser)

1. **Click the Logs tab to go to the Logs section.**
2. **From the View menu, choose Transaction Log.**

Monitoring Jobs by Using the Command-Line Interface (Task Map)

The following table identifies the procedures you need to monitor jobs by using the command-line interface. See the `changemgr(1MCM)` man page.

Task	Description	For Instructions
View the job queue.	View the job queue to monitor current and recent pending jobs, running jobs, and completed jobs.	See “How to View the Status of Jobs (Command Line)” on page 127.
Cancel jobs.	Cancel running jobs and pending jobs that appear in the job queue.	See “How to Cancel Jobs (Command Line)” on page 129.
Purge completed jobs from the job queue.	Purge completed jobs from the job queue. Running jobs and pending jobs are not affected.	See “How to Purge Completed Jobs From the Job Queue (Command Line)” on page 130.

Monitoring Jobs by Using the Command-Line Interface

The following procedures describe how to monitor jobs by using the job queue. In addition to viewing the job queue, you can purge completed jobs from the queue and cancel jobs from the queue.

▼ How to View the Status of Jobs (Command Line)

1. Determine whether to view the status of particular jobs or all jobs.

To specify one or more jobs, use the associated *job ID*. Otherwise, information is provided for all running jobs.

2. View the status of jobs.

```
$ changemgr jobs [ -u username ] [ -p file ] [ -l ] [ -o format ] [ id ... ]
```

<code>-u <i>username</i></code>	Specify the user name to authenticate. If this option is not specified, the user is the current UNIX user.
<code>-p <i>file</i></code>	<i>file</i> consists of a single line, which contains the password. If <i>file</i> is <code>-</code> , then the user can supply the password as standard input. If the <code>-p</code> option is not supplied, then the <code>changemgr</code> command prompts the user for his password.
<code>-l</code>	Present more detailed information about the jobs.
<code>-o <i>format</i></code>	<i>format</i> is a blank-separated list or comma-separated list of property names. If you separate the property names with spaces, make sure that you surround the list of property names with quotes. The specified property values are displayed in a name-value format. If <i>format</i> is specified as <code>all</code> , then all properties are displayed. The output is suitable for programmatic parsing.
<i>id</i>	Specifies particular job IDs. The job ID number is automatically assigned when the operation is initiated.

Example—Viewing the Status of All Jobs

Pat wants to see the status of all jobs: those started from the browser interface and those started from the command-line interface.

```
$ changemgr jobs
```

Example—Viewing the Job Details

Pat wants to see the job details for all jobs.

```
$ changemgr jobs -l
```

Example—Viewing the Status of Specified Jobs

Pat wants to see the status of job `IC_1234`.

```
$ changemgr jobs IC_1234
```

Example—Viewing the Properties of a Specific Job

Pat wants to see all the properties of job `IC_1234`.

```
$ changemgr jobs -o all IC_1234
```


▼ How to Cancel Jobs (Command Line)

Some Change Manager operations are *interrupted* when you cancel them and some are not.

When a cancel is issued for an *interruptable* job, the operation currently running on the managed hosts is immediately terminated. The job is canceled for any managed hosts waiting to run the job. The following operations *can* be interrupted:

- `changemgr audit`
- `changemgr export`
- `changemgr import`
- `changemgr info`
- `changemgr manifest`

When a cancel is issued for an *uninterruptable* job, the operation currently running on the managed hosts completes. The job is canceled for any managed hosts waiting to run the job. The following operations *cannot* be interrupted:

- `changemgr fallback`
- `changemgr halt`
- `changemgr reboot`
- `changemgr reinstall`
- `changemgr setup`
- `changemgr update`

1. Determine which jobs to cancel.

You can cancel pending jobs and running jobs.

To specify one or more jobs, use the associated job ID.

2. Cancel selected jobs.

```
$ changemgr kill [ -u username ] [ -p file ] id ...
```

For descriptions of the options, see “How to View the Status of Jobs (Command Line)” on page 127.

Example—Canceling a Job

Pat wants to cancel jobs IC_12345 and IC_12346.

```
$ changemgr kill IC_12345 IC_12346
```

▼ How to Purge Completed Jobs From the Job Queue (Command Line)

1. Determine which completed jobs to purge from the job queue.

You can purge only completed jobs.

To specify one or more jobs, use the associated job ID.

2. Purge completed jobs from the job queue.

```
$ changemgr ack [ -u username ] [ -p file ] id ...
```

For descriptions of the options, see “How to View the Status of Jobs (Command Line)” on page 127.

Example—Purging Completed Jobs From the Job Queue

Pat wants to purge the completed jobs, IC_12347 and IC_12348, from the job queue.

```
$ changemgr ack IC_12347 IC_12348
```

Maintaining the Change Manager Repository (Tasks)

The Change Manager repository is organized as a file manager. You can traverse through nested folders to view folder contents and file properties. You can also create folders and files.

Change Manager objects have properties associated with them. You can change properties for files by using the browser interface. You can change properties for files *and* folders by using the command-line interface.

The following topics are discussed in this chapter:

- “Maintaining the Change Manager Repository by Using the Browser Interface (Task Map)” on page 132
- “Maintaining the Change Manager Repository by Using the Browser Interface” on page 133
- “Maintaining the Change Manager Repository by Using the Command-Line Interface (Task Map)” on page 137
- “Maintaining the Change Manager Repository by Using the Command-Line Interface” on page 138

To perform operations, such as installation, update, and audit, go to the Hosts section. See Chapter 5 and Chapter 6.

Maintaining the Change Manager Repository by Using the Browser Interface (Task Map)

The following table identifies the procedures you need to set up files in the Change Manager repository.

Task	Description	For Instructions
Access the Files section and folder.	Access the Files section and the appropriate folder in the Change Manager repository.	See "How to Access the Files Section and Appropriate Folder (Web Browser)" on page 134.
Create a folder.	Create a folder in the Change Manager repository.	See "How to Create a Folder (Web Browser)" on page 134.
Rename a file or folder.	Rename a file or folder in the Change Manager repository.	See "How to Rename a File or Folder (Web Browser)" on page 134.
Export a file.	Export a file from the Change Manager repository.	See "How to Export a File From the Change Manager Repository (Web Browser)" on page 135.
Create a copy of a file.	Create a copy of a file in the current folder.	See "How to Create a Copy of a File (Web Browser)" on page 135.
Move files and folders.	Move files and folders to another folder in the Change Manager repository.	See "How to Move Files and Folders to Another Folder (Web Browser)" on page 136.
Delete files and folders.	Delete files and folders from the Change Manager repository.	See "How to Delete Files and Folders (Web Browser)" on page 136.
View folder contents.	View the contents of a folder.	See "How to View Folder Contents (Web Browser)" on page 136.

Task	Description	For Instructions
View or modify file properties.	View or modify the properties of files in the repository.	See “How to View or Modify File Properties (Web Browser)” on page 137.

Maintaining the Change Manager Repository by Using the Browser Interface

This section describes how to use the browser interface to manage the file hierarchy of the Change Manager repository.

Suffixes of file names in the Change Manager repository must reflect the type of file. The suffixes are as follows:

- .bmft for manifests
- .brul for audit rules files
- .cmsp for shared profiles
- .flar for Solaris Flash archives
- .miniroot for Solaris boot images
- .txt for reports

When you use the browser interface to name files in the repository, the appropriate suffix is *automatically* added to the file name you specify. However, if you specify the appropriate suffix in the file name, the name is used as-is.

For example, if you name a report file `cm08.status`, then the name of the report stored in the repository automatically becomes `cm08.status.txt`. If, however, you name the file `cm08.status.txt`, no `.txt` suffix is added because it is already the last part of the file name.

Note – When you use the command-line interface to name files in the repository, you *must* manually specify the suffix that indicates the type of the file.

To learn how to navigate through the browser interface, see Appendix A.

▼ How to Access the Files Section and Appropriate Folder (Web Browser)

Note that the top of the Files section hierarchy is a folder.

1. **To go to the Files section, click the Files tab in the general links area at the top of the page.**

The top-level Files page shows a table, which can contain files and folders. The table is a file manager.

2. **Drill down to the appropriate folder.**

Click a folder name to go into that folder. Then, view the folder's contents. Continue to click folder names until you reach the folder or file you want.

▼ How to Create a Folder (Web Browser)

Note that the top of the Files section hierarchy is a folder.

1. **If you are not already in the appropriate folder, see "How to Access the Files Section and Appropriate Folder (Web Browser)" on page 134.**

2. **From the File Actions menu, choose New Folder.**

3. **Supply a folder name.**

For example, create a folder named `apache` in which to store objects related to the Apache web server.

4. **Click Create to create the folder, return to the parent folder, and see the new folder.**

Click Cancel to return to the previous page.

▼ How to Rename a File or Folder (Web Browser)

The rename action can be taken on one file or folder at a time.

1. **If you are not already in the appropriate folder, see "How to Access the Files Section and Appropriate Folder (Web Browser)" on page 134.**

2. **Select the object to rename from the table.**

3. **From the File Actions menu, choose Rename.**

A page appears that shows the current name of the folder or file.

4. **Supply a new file name or new folder name in the New Name field.**

If the name you supply does not include the proper suffix, the application adds the suffix for you.

5. Click **Rename** to change the name of the folder or file in the Change Manager repository.

Click **Cancel** to return to the previous page.

▼ How to Export a File From the Change Manager Repository (Web Browser)

You can use the browser interface to export only one file at a time.

Note – Folders cannot be *exported*. Only files can be exported.

1. If you are not already in the appropriate folder, see “How to Access the Files Section and Appropriate Folder (Web Browser)” on page 134.
2. To select the file to export, click the checkbox next to the file name.
3. From the File Actions menu, choose **Export File**.
A page appears that shows the name of the file to export.
4. Supply a path name to the place outside of the repository to copy the file.
5. Click **Export** to copy the file outside of the repository.
Click **Cancel** to return to the previous page.

▼ How to Create a Copy of a File (Web Browser)

You can create a copy of a shared profile or an audit rules file only. You can use the browser interface to copy only one file at a time.

The copy of the file must be created in the same folder as the original file. To simulate the creation of a copy of a file in another folder, do the following:

1. Use the **Copy File** action to create the copy (described in this section)
 2. Use the **Move** action to move the copy to another folder (described in the next section)
1. If you are not already in the appropriate folder, see “How to Access the Files Section and Appropriate Folder (Web Browser)” on page 134.
 2. To select the file to copy, click the checkbox next to the file name.
 3. From the File Actions menu, choose **Copy File**.
A page appears that shows the name of the file to copy.

4. Supply a file name for the copy.

The copy of the file must be created in the same folder as the original file.

5. Click Copy to create the copy of the file.

Click Cancel to return to the previous page.

▼ How to Move Files and Folders to Another Folder (Web Browser)

1. If you are not already in the appropriate folder, see “How to Access the Files Section and Appropriate Folder (Web Browser)” on page 134.

2. To select the files and folders to move, click the checkbox next to the file and folder names.

3. From the File Actions menu, choose Move.

A page appears that shows the name of the files and folders to move.

4. Supply a path name to the destination folder in the Change Manager repository.

5. Click Move to move the files and folders to the other folder.

Click Cancel to return to the previous page.

▼ How to Delete Files and Folders (Web Browser)

Folders must be empty before you delete them.

1. If you are not already in the appropriate folder, see “How to Access the Files Section and Appropriate Folder (Web Browser)” on page 134.

2. To select the files and folders to delete, click the checkbox next to the file and folder names.

3. From the File Actions menu, choose Delete.

A page appears that shows the names of the files and folders to delete from the repository.

4. Click Delete to delete the files and folders.

Click Cancel to return to the previous page.

▼ How to View Folder Contents (Web Browser)

1. If you are not already in the appropriate folder, see “How to Access the Files Section and Appropriate Folder (Web Browser)” on page 134.

A page appears that shows the contents of the folder.

2. Click **Cancel** to return to the previous page.

▼ How to View or Modify File Properties (Web Browser)

This procedure describes how to use the browser interface to view and modify file properties in the Change Manager repository. The browser interface shows properties and their values on property pages for the object. To view an object's property page, click the name of the object.

1. If you are not already in the appropriate folder, see “How to Access the Files Section and Appropriate Folder (Web Browser)” on page 134.
2. Click the file name to access the file's property page to do either of the following:
 - View the file's properties.

The property pages for a manifest and a report are read-only.
Click **Cancel** to return to the file's parent folder.
 - Modify the file's property values.

Click **Save** to save the property value changes and return to the file's parent folder.
Click **Cancel** to return to the file's parent folder.

Maintaining the Change Manager Repository by Using the Command-Line Interface (Task Map)

The following table identifies the procedures you need to manage files in the Change Manager repository. See the `changemgr(1MCM)` man page.

Task	Description	For Instructions
Create a folder.	Create a folder in the Change Manager repository.	See “How to Create a Folder (Command Line)” on page 139.

Task	Description	For Instructions
Rename a file or folder.	Rename a file or folder in the Change Manager repository.	See "How to Rename a File or Folder (Command Line)" on page 139.
Export a file.	Export a file from the Change Manager repository.	See "How to Export Files to Another System (Command Line)" on page 140.
Move files and folders.	Move files and folders to another folder in the Change Manager repository.	See "How to Move Files and Folders to Another Folder (Command Line)" on page 141.
Delete files and folders.	Delete files and folders from the Change Manager repository.	See "How to Delete Files and Folders (Command Line)" on page 142.
View folder contents.	View the contents of a folder.	See "How to View Folder Contents (Command Line)" on page 142.
View file properties.	View the properties of files in the repository.	See "How to View File or Folder Properties (Command Line)" on page 144.
Modify file properties.	Modify the properties of files in the repository.	See "How to Modify File or Folder Properties (Command Line)" on page 145.

Maintaining the Change Manager Repository by Using the Command-Line Interface

This section describes how to use the command-line interface to manage the file hierarchy of the Change Manager repository.

▼ How to Create a Folder (Command Line)

Note – The top of the Files section hierarchy is a folder.

1. Determine where to create the folder.

For example, create a folder in the `web-server` folder.

2. Create and name the folder.

```
$ changemgr mkdir [ -u username ] [ -p file ] reldirpath ...
```

`-u username` Specify the user name to authenticate. If this option is not specified, the user is the current UNIX user.

`-p file` *file* consists of a single line, which contains the password. If *file* is `-`, then the user can supply the password as standard input.

If the `-p` option is not supplied, then the `changemgr` command prompts the user for his password.

reldirpath Specifies the path to a folder that is relative to the top of the Change Manager repository.

Choose a meaningful name that indicates the types of files the folder contains. For example, create a folder named `apache` in which to store objects related to the Apache web server.

Example—Creating a Folder

Suzi creates the `apache` folder in the `web-server` folder.

```
$ changemgr mkdir -p .pfile /web-server/apache
```

▼ How to Rename a File or Folder (Command Line)

The rename action can be taken on one file or folder at a time.

1. Determine which file or folder to rename.

For example, rename the `web-server/apache` folder to be `web-server/ApacheServer`.

2. Rename the file or folder.

```
$ changemgr filemove [ -u username ] [ -p file ] old_reldirpath.type \
new_reldirpath.type
```

<i>relfilepath</i>	Specifies the path to a file or folder. The path is relative to the top of the Change Manager repository.
<i>.type</i>	Specifies the file name suffix that represents the file type. File type suffixes are as follows: <ul style="list-style-type: none"> ■ <i>.flar</i> for archives ■ <i>.miniroot</i> for boot images ■ <i>.bmft</i> for manifests ■ <i>.brul</i> for audit rules files ■ <i>.txt</i> for reports ■ <i>.cmsp</i> for shared profiles

Folders do not use a file suffix.

For descriptions of the other options, see “How to Create a Folder (Command Line)” on page 139.

Example—Renaming a File or Folder

Suzi renames the `web-server/apache` folder to be `web-server/apacheServer`.

```
$ changemgr filemove /web-server/apache \
/web-server/apacheServer
```

▼ How to Export Files to Another System (Command Line)

Only files, not folders and Solaris boot images, can be exported.

1. Determine which files to export.

For example, *export* the `/web-server/apache/host1.bmft` file to `host2:/home/suzi`.

2. Export the files:

- Export a single file, *relfilepath*, from the repository as *filepath*.

```
$ changemgr export [ -u username ] [ -p file ] relfilepath filepath
```
- Export one or more files to the specified folder, *dirpath*, outside of the repository.

```
$ changemgr export [ -u username ] [ -p file ] relfilepath ... dirpath
```

dirpath Specifies an absolute or relative path to a directory. This directory is not within the Change Manager repository.

filepath Specifies an absolute or relative path to a file. This file path is not within the Change Manager repository.

relfilepath Specifies the path to a file, *not* including a folder, that is relative to the top of the Change Manager repository.

For descriptions of the other options, see “How to Create a Folder (Command Line)” on page 139.

Example—Exporting a File to Another System

Suzi exports the `/web-server/apache/host1.bmft` file to her home directory, `/net/host2/home/suzi`.

```
$ changemgr export /web-server/apache/host1.bmft \  
/net/host2/home/suzi/host1.bmft
```

Example—Exporting Files to Another System

Suzi exports the `/web-server/apache/host1.bmft` file and the `/web-server/apache/host2.bmft` file to her home directory, `/net/host2/home/suzi`.

```
$ changemgr export /web-server/apache/host1.bmft \  
/web-server/apache/host2.bmft /net/host2/home/suzi
```

▼ How to Move Files and Folders to Another Folder (Command Line)

1. Determine which files and folders to move.

For example, move the `web-server/host1.bmft` file and the `web-server/host2.bmft` file to the `web-server/ApacheServer` folder.

2. Move the files and folders to another folder in the Change Manager repository.

```
$ changemgr filemove [ -u username ] [ -p file ] relfilepath ... \  
reldirpath
```

relfilepath Specifies the path to a file or folder that is relative to the top of the Change Manager repository.

For descriptions of the other options, see “How to Create a Folder (Command Line)” on page 139.

Example—Moving Files and Folders to Another Folder

Suzi moves the `web-server/host1.bmft` file and the `web-server/host2.bmft` file to the `web-server/ApacheServer` folder.

```
$ changemgr filemove /web-server/host1.bmft \  
/web-server/host2.bmft /web-server/ApacheServer
```

▼ How to Delete Files and Folders (Command Line)

Folders must be empty before you delete them.

1. Determine which files and folders to delete.

For example, delete the `web-server/host1.bmft` file, the `host2.bmft` file, and the `web-server/ApacheServer` folder.

2. Delete the files and folders.

```
$ changemgr delete [ -u username ] [ -p file ] relfilepath ...
```

relfilepath Specifies the path to a file or folder that is relative to the top of the Change Manager repository.

For descriptions of the other options, see “How to Create a Folder (Command Line)” on page 139.

Example—Deleting Files and Folders

Suzi deletes the `web-server/host1.bmft` file, the `host2.bmft` file, and the `web-server/ApacheServer` folder.

```
$ changemgr delete /web-server/host1.bmft \  
/web-server/host2.bmft /web-server/ApacheServer
```

▼ How to View Folder Contents (Command Line)

A folder can contain files and other folders.

To modify folder properties, see “How to Modify File or Folder Properties (Command Line)” on page 145.

1. Determine which folder to view.

For example, view the contents of the `web-server/ApacheServer` folder.

2. View the folder contents.

```
$ changemgr files [ -u username ] [ -p file ] [ -l ] [ -d ] [ -R ] \
[ -o format ] [ relfilepath ... ]
```

-l Present detailed information in tabular form.

-d Present information about the folder itself, rather than about the folder's contents.

-R Describe all the folder's descendents.

-o *format* *format* is a blank-separated list or comma-separated list of property names. If you separate the property names with spaces, make sure that you surround the list of property names with quotes. The specified property values are displayed in a name-value format. If *format* is specified as *all*, then all properties are displayed. The output is suitable for programmatic parsing.

relfilepath Specifies the path to a file or folder that is relative to the top of the Change Manager repository.

For descriptions of the other options, see "How to Create a Folder (Command Line)" on page 139.

Example—Viewing Contents of the Root of the Repository

Suzi views the contents of the root of the Change Manager repository, which is the root folder.

```
$ changemgr files
```

Example—Viewing Folder Contents

Suzi views the contents of the `web-server/ApacheServer` folder.

```
$ changemgr files /web-server/ApacheServer
```

Example—Viewing Information About the Folder

Suzi views the information about the `web-server/ApacheServer` folder.

```
$ changemgr files -d /web-server/ApacheServer
```

Example—Viewing Folder Contents in Table Form

Suzi views the contents of the `web-server/ApacheServer` folder in table form.

```
$ changemgr files -l /web-server/ApacheServer
```

Example—Viewing Folder Contents and Contents of the Folder’s Descendents

Suzi views the contents of the `web-server/ApacheServer` folder and the folder’s descendents.

```
$ changemgr files -R /web-server/ApacheServer
```

Example—Viewing Folder Contents and Specific Properties

Suzi views the contents of the `web-server/ApacheServer` folder. She wants to see the values of the `Description` property and the `save` property for each object. Note that you can use either format shown.

```
$ changemgr files -o Description,save /web-server/ApacheServer
```

```
$ changemgr files -o "Description save" /web-server/ApacheServer
```

Example—Viewing Folder Contents and All Properties

Suzi views the contents of the `web-server/ApacheServer` folder and wants to see the values of all the properties for each object.

```
$ changemgr files -o all /web-server/ApacheServer
```

Example—Viewing Detailed Information About the Contents and Properties of a Folder and Its Descendents

Suzi views detailed information in table form about the contents and all properties of the `web-server/ApacheServer` folder and the folder’s descendents.

```
$ changemgr files -l -R -o all /web-server/ApacheServer
```

▼ How to View File or Folder Properties (Command Line)

- To view file or folder properties, see “How to View Folder Contents (Command Line)” on page 142.

▼ How to Modify File or Folder Properties (Command Line)

1. Determine which file or folder properties you want to modify.

- **File** – For example, modify the properties of the `web-server/ApacheServer/ApacheWebServer.flar` file.
- **Folder** – For example, modify the properties of the `web-server/ApacheServer` folder.

2. To modify the properties, supply the property names and values.

```
$ changemgr fileset [ -u username ] [ -p file ] [ -s name=value ] ... \
[ -s name ] ... relfilepath ...
```

`-s name=value` Specify one or more name-value pairs. *name* is the property name, and *value* is the property value. Supply this option for each property value you want to set. If *value* is blank, then the property is assigned an empty value.

`-s name` Specify one or more property names to delete, where *name* is the property name. Supply this option for each property you want to delete.

relfilepath Specifies the path to a file or folder that is relative to the top of the Change Manager repository.

For descriptions of the other options, see “How to Create a Folder (Command Line)” on page 139.

Example—Modifying File Properties

Suzi modifies the Description property of the `web-server/ApacheServer/ApacheWebServer.flar` file.

```
$ changemgr fileset -s Description="Apache Web Server archive" \
/web-server/ApacheServer/ApacheWebServer.flar
```

Example—Deleting a File Property

Suzi deletes the Description property of the `web-server/ApacheServer/ApacheWebServer.flar` file.

```
$ changemgr fileset -s Description \
/web-server/ApacheServer/ApacheWebServer.flar
```

Example—Deleting File Properties

Suzi deletes the `Description` property and the `Name` property from the `web-server/ApacheServer/ApacheWebServer.flar` file.

```
$ changemgr fileset -s Description -s Name \  
/web-server/ApacheServer/ApacheWebServer.flar
```

Example—Deleting a File Property From One or More Files

Suzi deletes the `Description` property from the `web-server/ApacheServer/ApacheWebServer.flar` file and the `web-server/ApacheServer/ApacheWebServer.txt` file.

```
$ changemgr fileset -s Description \  
/web-server/ApacheServer/ApacheWebServer.flar \  
/web-server/ApacheServer/ApacheWebServer.txt
```

Example—Recursively Setting Folder Properties

Suzi recursively sets the `Description` property of the contents of the `web-server/Apache Server` folder.

```
$ changemgr fileset -R \  
-s Description="File related to the Apache Web Server" \  
/web-server/ApacheServer
```

Example—Modifying Folder Properties

Suzi modifies the `Description` property of the `web-server/Apache Server` folder.

```
$ changemgr fileset \  
-s Description="Folder to hold Apache Web Server files" \  
/web-server/ApacheServer
```

Maintaining the Change Manager Topology (Tasks)

This chapter describes the Change Manager *topology* and procedures for organizing it. If Sun Management Center is configured with more than one *administrative domain*, then you can create a hierarchy of host groups and managed hosts in these administrative domains. A *managed host* is a host that is controlled by the Change Manager. A *host group* is a collection of managed hosts and other host groups.

Like the Change Manager repository, the administrative domain is organized as a file manager. You can use host groups to organize managed hosts into logical units. You can perform actions on individual managed hosts or on host groups.

The following topics are covered in this chapter:

- “Change Manager Host Object Types” on page 147
- “Maintaining the Change Manager Topology by Using the Browser Interface (Task Map)” on page 150
- “Maintaining the Change Manager Topology by Using the Browser Interface” on page 151
- “Maintaining the Change Manager Topology by Using the Command-Line Interface (Task Map)” on page 156
- “Maintaining the Change Manager Topology by Using the Command-Line Interface” on page 157

Change Manager Host Object Types

Change Manager supports three host object types: managed hosts, host groups, and administrative domains. Change Manager can perform operations on managed hosts and host groups.

You can use host groups to create a hierarchy in which to organize managed hosts. Managed hosts can belong to one or more host groups, which enables you to view the same managed hosts from different perspectives.

You can organize the host groups and managed hosts in the following ways:

- **Group like host types** – For example, store all Netra X1 machines in a single host group. Do the same for other hardware types.
- **Group managed hosts related to a particular service** – Create a host group to hold all the managed hosts associated with a particular service. For example, a *server farm* manages web services. Therefore, create a host group named `WebServer`. In the `WebServer` host group, store the managed hosts used in the web server farm.
- **Group managed hosts by geography** – Create a host group to hold all the managed hosts that exist in a city, office suite, building, floor, or rack. For example, your company's Los Angeles office is located on the 6th floor. Therefore, create a host group named `6th floor`. In the `6th floor` host group, store the managed hosts that are on the 6th floor of your office.
- **Group managed hosts by administrator** – Create a host group to hold all the managed hosts administered by a system administrator. For example, Pat and Chris administer the managed hosts for your company. Therefore, create host groups named `pat` and `chris`. In the `pat` host group, store the managed hosts that are administered by Pat. Store Chris's managed hosts in the `chris` host group.
- **Group managed hosts by organization** – Create a host group to hold all the managed hosts for each organization. For example, group managed hosts for your marketing and engineering organizations. Therefore, create host groups named `marketing` and `engineering`.

Host Group

A *host group* is a container that holds managed hosts and other host groups. Click a host group name to change into that host group and view its contents.

Perform the following actions from a host group:

- Add a host group
- Add a managed host
- Import multiple managed hosts from a file
- Rename a managed host or host group
- Move a managed host or host group to another host group
- Remove a managed host or host group

Managed Host

A *managed host* is a host that is managed by the Change Manager. You can perform actions and run jobs on managed hosts.

Managed hosts in the Change Manager topology have a standard set of properties associated with them:

Description	User-supplied string that describes the managed host.
AgentPort	Port number the agent uses to communicate with the Change Manager server.

Note – If you change the value of this property after installing a managed host, the Change Manager server will no longer be able to communicate with it. To reestablish communication with the server by using the new agent port, you must re-initialize the managed host by performing an initial installation on it.

Owner	Read-only property that names the owner of the managed host.
State	Read-only property that indicates the state of the managed host.

Modify the managed host's configuration by specifying the following:

- Ethernet address
- Platform group of the hardware
- Shared profile to use
- Values for archive-specific parameters

Perform the following actions on this managed host:

- Rename a managed host
- Copy a managed host to another host group
- Move the managed host to another host group
- Remove the managed host

Maintaining the Change Manager Topology by Using the Browser Interface (Task Map)

The following table identifies the procedures you need to add hosts in your administrative domain.

Task	Description	For Instructions
Access the Hosts section, administrative domain, and host group.	Access the Hosts section and the appropriate host group in your administrative domain.	See "How to Access the Hosts Section and Appropriate Administrative Domain and Host Group (Web Browser)" on page 151.
Create a host group.	Create a host group in your administrative domain.	See "How to Create a Host Group (Web Browser)" on page 152.
Rename a managed host or host group.	Rename a managed host or host group in your administrative domain.	See "How to Rename a Managed Host or Host Group (Web Browser)" on page 152.
Copy a managed host.	Copy a managed host to another host group in your administrative domain.	See "How to Copy Managed Hosts to Another Host Group (Web Browser)" on page 153.
Move managed hosts and host groups.	Move managed hosts and host groups to another host group in your administrative domain.	See "How to Move Managed Hosts and Host Groups to Another Host Group (Web Browser)" on page 154.
Remove managed hosts and host groups.	Remove managed hosts and host groups from your administrative domain.	See "How to Remove Managed Hosts and Host Groups (Web Browser)" on page 154.
View host group contents.	View the contents of a host group in your administrative domain.	See "How to View the Contents of a Host Group (Web Browser)" on page 155.

Task	Description	For Instructions
View and modify managed host properties.	View and modify the properties of a managed host in your administrative domain.	See “How to View or Modify Managed Host Properties (Web Browser)” on page 155.

Maintaining the Change Manager Topology by Using the Browser Interface

The following procedures describe some of the tasks to perform from the Hosts section. To initiate deployment jobs, see Chapter 5. To initiate audit jobs, see Chapter 6.

You can create administrative domains by using the Sun Management Center application. If more than one administrative domain exists, the top-level Hosts page lists the administrative domains available to the Change Manager. Click the name of the domain in which your managed hosts reside. If only the default domain exists, then the top-level page lists the host groups and managed hosts in the default domain. Then, from the Hosts section, initiate jobs on managed hosts.

Note – Perform the actions on the Host Actions drop-down menu while in the appropriate host group. For example, to create a host group inside an existing host group, go to the existing host group *before* choosing Add Group from the Host Actions menu.

To learn how to navigate through the browser interface, see Appendix A.



Caution – Do *not* remove the managed host element that represents your Change Manager server. This host is created automatically when the Sun Management Center server software is installed on the Change Manager server.

▼ How to Access the Hosts Section and Appropriate Administrative Domain and Host Group (Web Browser)

1. To go to the Hosts section, click the Hosts tab in the general links area at the top of the page.

- If more than one administrative domain exists, you go to a page showing a table that lists the available administrative domains. Go to Step 2.
- If only one administrative domain exists, the page shows a table that lists managed hosts and host groups in the default domain. Go to Step 3.

2. (Optional) Click the name of the administrative domain to use.

Note – Use Sun Management Center to create a new administrative domain. See “Using Sun Management Center Administrative Domains” in *Sun Management Center 3.0 Software User’s Guide*.

3. Drill down to the appropriate host group.

Click a host group name to go into that host group. Then, view the host group’s contents. Continue to click host group names until you reach the host group or managed host you want.

▼ How to Create a Host Group (Web Browser)

1. If you are not already in the appropriate host group, see “How to Access the Hosts Section and Appropriate Administrative Domain and Host Group (Web Browser)” on page 151.
2. From the Host Actions menu, choose Add Group.
3. Supply a host group name.
Choose a meaningful name, for example, a name that indicates the types of managed hosts and host groups that the host group contains.
4. Click Add to create the host group.
Click Cancel to return to the previous page.

▼ How to Rename a Managed Host or Host Group (Web Browser)

Rename only one managed host or host group at a time.

Note – Changing the name of a managed host with the Change Manager *only* changes how that managed host is labeled in that particular host group.

Changing the name does *not* change the following:

- How that managed host is labeled in other host groups
 - The name by which the managed host is known in the naming service
 - The name the managed host calls itself
-

1. If you are not already in the appropriate host group, see “How to Access the Hosts Section and Appropriate Administrative Domain and Host Group (Web Browser)” on page 151.
2. Click the checkbox next to the managed host name or host group name to select it.
3. From the Host Actions menu, choose **Rename**.
A page appears that shows the current managed host name or host group name and a field in which to type the new name.
4. Supply a new name.
5. Click **Rename** to change the name of the managed host or host group in your administrative domain.
Click **Cancel** to return to the previous page.

▼ How to Copy Managed Hosts to Another Host Group (Web Browser)

Managed hosts can belong to one or more host groups. To learn why you might want to have managed hosts belong to one or more host groups, see “Change Manager Host Object Types” on page 147.

Note – Managed hosts can only be copied to existing host groups. To create a host group in which to copy a managed host, see “How to Create a Host Group (Web Browser)” on page 152.

1. If you are not already in the appropriate host group, see “How to Access the Hosts Section and Appropriate Administrative Domain and Host Group (Web Browser)” on page 151.
2. Select the managed hosts to copy.
3. From the Host Actions menu, choose **Copy Hosts**.

A page appears that shows the name of the managed host and a field in which to type the other host group.

4. Supply a path name to another host group in your administrative domain.

Click Browse to launch a chooser window. Use the chooser to locate the other host group.

5. Click Copy to copy the managed host to the other host group.

Click Cancel to return to the previous page.

▼ How to Move Managed Hosts and Host Groups to Another Host Group (Web Browser)

1. If you are not already in the appropriate host group, see “How to Access the Hosts Section and Appropriate Administrative Domain and Host Group (Web Browser)” on page 151.

2. Select the managed hosts and host groups to move.

3. From the Host Actions menu, choose Move.

A page appears that shows the current managed host name and host group name and a field in which to input the other host group.

4. Supply a path name to another host group in your administrative domain.

Click Browse to launch a chooser window. Use the chooser to locate the other host group.

5. Click Move to move the managed hosts and host groups to the other host group.

Click Cancel to return to the previous page.

▼ How to Remove Managed Hosts and Host Groups (Web Browser)

Remove only empty host groups.

1. If you are not already in the appropriate host group, see “How to Access the Hosts Section and Appropriate Administrative Domain and Host Group (Web Browser)” on page 151.

2. Select the managed hosts and host groups to remove.

3. From the Host Actions menu, choose Remove.

A page appears that shows the names of the managed hosts and host groups to remove.

4. Click **Remove** to remove the managed hosts and host groups.
Click **Cancel** to return to the previous page.

▼ How to View the Contents of a Host Group (Web Browser)

1. If you are not already in the appropriate host group, see “How to Access the Hosts Section and Appropriate Administrative Domain and Host Group (Web Browser)” on page 151.
2. Click the host group name to view that host group.
A page appears that shows the contents of the host group.
3. To return to the previous host group, click the name of the parent host group in the bread crumbs.

▼ How to View or Modify Managed Host Properties (Web Browser)

1. If you are not already in the appropriate host group, see “How to Access the Hosts Section and Appropriate Administrative Domain and Host Group (Web Browser)” on page 151.
2. Click the managed host’s name to do either of the following:
 - View the managed host’s properties.
Click **Cancel** to return to the managed host’s parent host group.
 - Modify the property values of the managed host.
Click **Save** to save the property value changes and return to the parent host group.
Click **Cancel** to return to the parent host group.

Maintaining the Change Manager Topology by Using the Command-Line Interface (Task Map)

The following table identifies the procedures you need to manage the Change Manager topology. See the `changemgr(1MCM)` man page.

Task	Description	For Instructions
Specify an administrative domain.	Specify the administrative domain to use for creating managed hosts and host groups.	See "How to Specify the Administrative Domain in Which to Add Hosts (Command Line)" on page 157.
Create a host group.	Create a host group in your administrative domain.	See "How to Create a Host Group (Command Line)" on page 158.
Rename a managed host or host group.	Rename a managed host or host group in your administrative domain.	See "How to Rename a Managed Host or Host Group (Command Line)" on page 159.
Copy a managed host.	Copy a managed host to another host group in your administrative domain.	See "How to Copy Managed Hosts to Another Host Group (Command Line)" on page 159.
Move managed hosts and host groups.	Move managed hosts and host groups to another host group in your administrative domain.	See "How to Move Managed Hosts and Host Groups to Another Host Group (Command Line)" on page 160.
Remove managed hosts and host groups.	Remove managed hosts and host groups from your administrative domain.	See "How to Remove Managed Hosts and Host Groups (Command Line)" on page 161.
View host group contents.	View the contents of a host group in your administrative domain.	See "How to View the Contents of a Host Group (Command Line)" on page 161.

Task	Description	For Instructions
View managed host properties.	View the properties of a managed host in your administrative domain.	See “How to View Managed Host Properties (Command Line)” on page 163.
Modify managed host properties.	Modify the properties of a managed host in your administrative domain.	See “How to Modify Managed Host Properties (Command Line)” on page 164.
View host group properties.	View the properties of a host group in your administrative domain.	See “How to View Host Group Properties (Command Line)” on page 166.
Modify host group properties.	Modify the properties of a host group in your administrative domain.	See “How to Modify Host Group Properties (Command Line)” on page 166.

Maintaining the Change Manager Topology by Using the Command-Line Interface

To initiate deployment jobs, see Chapter 5. To initiate audit jobs, see Chapter 6.

▼ How to Specify the Administrative Domain in Which to Add Hosts (Command Line)

1. **Determine the name of the administrative domain you want to use.**
2. **Use the `-d domain` option with the `changemgr` command to supply the name of the administrative domain.**

`$ changemgr subcommand other-options -d domain operands`

For example, specify an administrative domain named `web-domain` in which to store the topology.

Example—Specifying an Administrative Domain in Which to Add Hosts

Chris views the contents of the `web-server/ApacheServer` host group, which is in the `web-domain` administrative domain.

```
$ changemgr hosts -d web-domain /web-server/ApacheServer
```

▼ How to Create a Host Group (Command Line)

1. Determine where to create the host group.

For example, create a host group in the `web-server` host group.

2. Create a host group.

```
$ changemgr mkgroup [ -u username ] [ -p file ] [ -d domain ] \  
grouppath ...
```

`-u username` Specify the user name to authenticate. If this option is not specified, the user is the current UNIX user.

`-p file` *file* consists of a single line, which contains the password. If *file* is `-`, then the user can supply the password as standard input.

If the `-p` option is not supplied, then the `changemgr` command prompts the user for his password.

`-d domain` Specify the administrative domain on which to operate. In the context of a session, the default is the domain specified for the session. If no domain is specified, *domain* is the user's home domain. By default, *domain* is the user's home domain.

grouppath Specifies the path to a host group that is relative to the top of the selected administrative domain.

Choose a host group name that indicates the types of managed hosts the host group contains. For example, create a host group named `apache` in which to group managed hosts that run the Apache web server.

Example—Creating a Host Group

Chris creates the `apache` host group in the `web-server` host group.

```
$ changemgr mkgroup /web-server/apache
```

▼ How to Rename a Managed Host or Host Group (Command Line)

You can rename only one managed host or host group at a time.

Note – Changing the name of a managed host with the Change Manager *only* changes how that managed host is labeled in that particular host group.

Changing the name does *not* change the following:

- How that managed host is labeled in other host groups
 - The name by which the managed host is known in the naming service
 - The name the managed host calls itself
-

1. Determine which managed host or host group to rename.

For example, rename the `web-server/apache` host group to be `web-server/ApacheServer`.

2. Rename the managed host or host group.

```
$ changemgr hostmove [ -u username ] [ -p file ] [ -d domain ] \  
old_topopath new_topopath
```

topopath Specifies the path to a managed host or host group that is relative to the top of the selected administrative domain.

For descriptions of the other options, see “How to Create a Host Group (Command Line)” on page 158.

Example—Renaming a Managed Host or Host Group

Chris renames the `web-server/apache` host group to be `web-server/ApacheServer`.

```
$ changemgr hostmove /web-server/apache \  
/web-server/ApacheServer
```

How to Copy Managed Hosts to Another Host Group (Command Line)

To copy a managed host to another host group, you must add a managed host to that group. See “How to Add Managed Hosts (Command Line)” on page 89.

Note – Managed hosts can only be copied to an existing host group. To create a host group in which to copy a managed host, see “How to Create a Host Group (Command Line)” on page 158.

▼ How to Move Managed Hosts and Host Groups to Another Host Group (Command Line)

1. **Determine which managed hosts and host groups to move and the destination host group.**

For example, move `/web-server/host1` and `/web-server/host2` to the `web-server/apacheServer` host group.

2. **Move the managed hosts and host groups to the other host group.**

```
$ changemgr hostmove [ -u username ] [ -p file ] [ -d domain ] \  
old_topopath ... new_groupopath
```

topopath Specifies the path to a managed host or host group that is relative to the top of the selected administrative domain.

For descriptions of the other options, see “How to Create a Host Group (Command Line)” on page 158.

Example—Moving Managed Hosts to Another Host Group

Chris moves the `/web-server/host1` and `/web-server/host2` managed hosts to the `web-server/apacheServer` host group.

```
$ changemgr hostmove /web-server/host1 /web-server/host2 \  
/web-server/apacheServer
```

Example—Moving Host Groups to Another Host Group

Chris moves the `apacheServer` and `NewServer` host groups to the `web-server` host group.

```
$ changemgr hostmove apacheServer NewServer /web-server
```


▼ How to Remove Managed Hosts and Host Groups (Command Line)

You can only remove a host group that is empty.

1. Determine which managed hosts and host groups to remove.

For example, remove the `/web-server/host1` and `/web-server/host2` managed hosts and the `/web-server` host group.

2. Remove the managed hosts and host groups.

```
$ changemgr remove [ -u username ] [ -p file ] [ -d domain ] \  
topopath ...
```

topopath Specifies the path to a managed host or host group that is relative to the top of the selected administrative domain.

For descriptions of the other options, see “How to Create a Host Group (Command Line)” on page 158.

Example—Removing Managed Hosts and Host Groups

Chris removes the `/web-server/host1` and `/web-server/host2` managed hosts and the `/web-server` host group.

```
$ changemgr remove /web-server/host1 /web-server/host2 \  
/web-server
```

▼ How to View the Contents of a Host Group (Command Line)

A host group can contain managed hosts and other host groups.

To view host group properties, see “How to View Host Group Properties (Command Line)” on page 166. To modify host group properties, see “How to Modify Host Group Properties (Command Line)” on page 166.

1. Determine which host group to view.

For example, view the contents of the `web-server` host group.

2. View the host group.

```
$ changemgr hosts [ -u username ] [ -p file ] [ -d domain ] \  
[ -l ] [ -g ] [ -R ] [ -o format ] [ topopath ... ]
```

`-l` Present detailed information about the specified managed hosts and host groups in tabular form.

- g Present information about the host group itself, rather than about the host group's contents.
- R Describe all the host group's descendents.
- o *format* *format* is a blank-separated list or comma-separated list of property names. If you separate the property names with spaces, make sure that you surround the list of property names with quotes. The specified property values are displayed in a name-value format. If *format* is specified as `all`, then all properties are displayed. The output is suitable for programmatic parsing.
- topopath* Specifies the path to a managed host or host group that is relative to the top of the selected administrative domain.

For descriptions of the other options, see "How to Create a Host Group (Command Line)" on page 158.

Example—Viewing the Contents of the Current Host Group

Chris views the contents of the host group at the root of the administrative domain.

```
$ changemgr hosts
```

Example—Viewing Host Group Contents

Chris views the contents of the `web-server/ApacheServer` host group.

```
$ changemgr hosts /web-server/ApacheServer
```

Example—Viewing Information About the Host Group

Chris views the information about the `web-server/ApacheServer` host group.

```
$ changemgr hosts -g /web-server/ApacheServer
```

Example—Viewing Host Group Contents in Table Form

Chris views the contents of the `web-server/ApacheServer` host group in table form.

```
$ changemgr hosts -l /web-server/ApacheServer
```

Example—Viewing Host Group Contents and Contents of the Host Group’s Descendents

Chris views the contents of the web-server/ApacheServer host group and its descendents.

```
$ changemgr hosts -R /web-server/ApacheServer
```

Example—Viewing Host Group Contents and Specific Properties

Chris views the contents of the web-server/ApacheServer host group. Chris wants to see the values of the Description property and the base_config_templateName property for each of the managed hosts in /web-server/ApacheServer. Note that you can use either format shown.

```
$ changemgr hosts -o Description,base_config_templateName \  
/web-server/ApacheServer
```

```
$ changemgr hosts -o "Description base_config_templateName" \  
/web-server/ApacheServer
```

Example—Viewing Host Group Contents and All Properties

Chris views the contents of the web-server/ApacheServer host group and wants to see the values of all the properties for each managed host and host group.

```
$ changemgr hosts -o all /web-server/ApacheServer
```

▼ How to View Managed Host Properties (Command Line)

To modify managed host properties, see “How to Modify Managed Host Properties (Command Line)” on page 164.

1. Determine which managed host’s properties to view.

For example, view the properties of web-server/ApacheServer/host1.

2. View the properties of the managed host.

```
$ changemgr hosts [ -u username ] [ -p file ] [ -d domain ] \  
[ -l ] [ -g ] [ -R ] [ -o format ] [ topopath ... ]
```

- l Present detailed information about the specified managed hosts and host groups in tabular form.
- g Present information about the host group itself, rather than about the host group's contents.
- R Describe all the host group's descendents.
- o *format* *format* is a blank-separated list or comma-separated list of property names. If you separate the property names with spaces, make sure that you surround the list of property names with quotes. The specified property values are displayed in a name-value format. If *format* is specified as *all*, then all properties are displayed. The output is suitable for programmatic parsing.
- topopath* Specifies the path to a managed host or host group that is relative to the top of the selected administrative domain.

For descriptions of the other options, see "How to Create a Host Group (Command Line)" on page 158.

Example—Viewing Managed Host Properties

Chris views the properties of `web-server/ApacheServer/host1`.

```
$ changemgr hosts -o all /web-server/ApacheServer/host1
```

▼ How to Modify Managed Host Properties (Command Line)

For the list of properties, see Chapter 10.

1. Determine the managed host's properties that you want to modify.

For example, modify the properties of the `web-server/ApacheServer/host2` managed host.

2. Modify the property values of the managed host.

```
$ changemgr hostset [ -u username ] [ -p file ] [ -d domain ] \
[ -s name=value ] ... [ -s name ] ... topopath ...
```

- s *name=value* Specify one or more name-value pairs. *name* is the property name, and *value* is the property value. Supply this option for each property value you want to set. If *value* is blank, then the property is assigned an empty value.

-s name Specify one or more property names to delete, where *name* is the property name. Supply this option for each property you want to delete.

topopath Specifies the path to a managed host or host group that is relative to the top of the selected administrative domain.

For descriptions of the other options, see “How to Create a Host Group (Command Line)” on page 158.

Example—Modifying a Managed Host Property

Chris modifies the `Description` property of the `web-server/ApacheServer/host2` managed host.

```
$ changemgr hostset -s Description="Apache Web Server: host2" \  
/web-server/ApacheServer/host2
```

Example—Modifying Managed Host Properties

Chris modifies the `Description` and `base_config_target_arch` properties for `web-server/ApacheServer/host2`.

```
$ changemgr hostset -s Description="Apache Web Server: host2" \  
-s base_config_target_arch=sun4u /web-server/ApacheServer/host2
```

Example—Deleting a Managed Host Property

Chris deletes the `Description` property of the `web-server/ApacheServer/host2` managed host.

```
$ changemgr hostset -s Description /web-server/ApacheServer/host2
```

Example—Recursively Setting Host Group Properties

Chris recursively sets the `Description` property of the contents of the `web-server` host group.

```
$ changemgr hostset -R -s Description="Web Server managed host" /web-server
```

▼ How to View Host Group Properties (Command Line)

To modify host group properties, see “How to Modify Host Group Properties (Command Line)” on page 166.

1. Determine which host group’s properties to view.

For example, view the properties of the web-server/ApacheServer host group.

2. View host group properties.

```
$ changemgr hosts [ -u username ] [ -p file ] [ -d domain ] \  
[ -l ] [ -g ] [ -R ] [ -o format ] [ topopath ... ]
```

-l Present detailed information about the specified managed hosts and host groups in tabular form.

-g Present information about the host group itself, rather than about the host group’s contents.

-R Describe all the host group’s descendents.

-o *format* *format* is a blank-separated list or comma-separated list of property names. If you separate the property names with spaces, make sure that you surround the list of property names with quotes. The specified property values are displayed in a name-value format. If *format* is specified as *all*, then all properties are displayed. The output is suitable for programmatic parsing.

topopath Specifies the path to a managed host or host group that is relative to the top of the selected administrative domain.

For descriptions of the other options, see “How to Create a Host Group (Command Line)” on page 158.

Example—Viewing Host Group Properties

Chris views the contents of the web-server/ApacheServer host group.

```
$ changemgr hosts -g -o all /web-server/ApacheServer
```

▼ How to Modify Host Group Properties (Command Line)

For the list of properties, see Chapter 10.

1. Determine the host group’s properties that you want to modify.

For example, modify the properties of the web-server/ApacheServer host group.

2. Modify host group properties.

```
$ changemgr hostset [ -u username ] [ -p file ] \  
[ -s name=value ] ... [ -s name ] ... topopath ...
```

-s name=value Specify one or more name-value pairs. *name* is the property name, and *value* is the property value. Supply this option for each property value you want to set. If *value* is blank, then the property is assigned an empty value.

-s name Specify one or more property names to delete, where *name* is the property name. Supply this option for each property you want to delete.

topopath Specifies the path to a managed host or host group that is relative to the top of the selected administrative domain.

For descriptions of the other options, see “How to Create a Host Group (Command Line)” on page 158.

Example—Modifying Host Group Properties

Chris modifies the Description property of the web-server/ApacheServer host group.

```
$ changemgr hostset \  
-s Description="Host group to hold Apache Web Server hosts" \  
/web-server/ApacheServer
```


Creating Shared Profiles and Host Properties (Reference)

Both shared profiles and host properties describe how one or more managed hosts are configured with a software stack. Much of the information in these profiles is the same as described in an installation profile. See the `cmssp(4CM)` man page.

The following topics are discussed in this chapter.

- “Parameters Used by Shared Profiles and Host Properties” on page 169
- “Minimum Set of Parameters to Deploy Software” on page 176

In this chapter, the term *parameter* is interchangeable with the term *property*.

Parameters Used by Shared Profiles and Host Properties

The parameters that you can set to configure managed hosts are as follows:

- “Managed Host Parameters” on page 169
- “Archive Parameters” on page 170
- “Sysid Parameters” on page 170
- “Disk Layout Parameters” on page 173

Managed Host Parameters

The following parameters are used by managed hosts (host properties) only. These parameters specify information about a single managed host.

`base_config_templateName`

Name of a shared profile associated with this managed host.

This parameter can only be specified by host properties.

`base_config_target_ether_addr`
Ethernet (MAC) address of this managed host.

This parameter can only be specified by host properties.

`base_config_sysidcfg_hostname`
A fully qualified name of the managed host.

`base_config_sysidcfg_ipaddr`
IP address of the managed host. This read-only parameter's value is set in the naming service.

Archive Parameters

The following parameters specify information about the particular Solaris Flash archive.

`base_config_flar_archive`
Name of the archive to be used. The name is a path relative to the top of the Change Manager repository.

parameter_name=value

Parameters that are defined by the archive itself. These parameters names are *not* prefixed with `base_config_`. These parameters are made available to the finish scripts that run on the managed host.

Sysid Parameters

The following parameters specify `sysid` information for the managed host.

`base_config_target_arch`
Platform architecture of the managed host. Run the `uname -m` command to obtain this information.

This parameter can be set either in the host properties or in the shared profile.

`base_config_sysidcfg_rootpw`
Encrypted superuser password for the managed host. You can obtain the encrypted password from the `/etc/shadow` file.

`base_config_sysidcfg_nameservice`
One of the following values: *NIS*, *NIS+*, *DNS*, *LDAP*, or *NONE*.

The default value is *NONE*.

The required parameters depend on the value of `base_config_sysidcfg_nameservice` as follows:

- **NONE** – No other parameters are required.
- **NIS or NIS+** – You must specify values for the `base_config_sysidcfg_nameserver` and `base_config_sysidcfg_domainname` parameters.
- **DNS** – You must specify values for the `base_config_sysidcfg_nameserver`, `base_config_sysidcfg_domainname`, `base_config_sysidcfg_dnsservers`, and `base_config_sysidcfg_searchdomains` parameters.
- **LDAP** – You must specify values for the `base_config_sysidcfg_domainname`, `base_config_sysidcfg_ldap_profile`, and `base_config_sysidcfg_ldap_server` parameters.

`base_config_sysidcfg_nameserver`

- If the value of `base_config_sysidcfg_nameservice` is NIS or NIS+, then the value of this parameter is the fully qualified name server name. If no value is set, then the naming service looks for a name server.
- If the value of `base_config_sysidcfg_nameservice` is DNS, then this parameter's value is a comma-separated list of fully qualified DNS server names.

`base_config_sysidcfg_domainname`

A fully qualified DNS, LDAP, NIS+, or NIS domain name.

`base_config_sysidcfg_dnsservers`

If `base_config_sysidcfg_nameservice` is DNS, then the value of this parameter must list at least one DNS server. DNS server names are separated by commas.

`base_config_sysidcfg_searchdomains`

If `base_config_sysidcfg_nameservice` is DNS, then the value of this parameter must list DNS search domains. DNS search domains are separated by commas.

`base_config_sysidcfg_ldap_profile`

Name of the LDAP profile.

`base_config_sysidcfg_ldap_server`

IP address of the LDAP server that contains the LDAP profile.

`base_config_sysidcfg_networkinterface`

The *network interface* to be used. Choose one of the following values: PRIMARY or *value*.

The default value is PRIMARY.

- **PRIMARY** – Use the first-up, non-loopback interface that is found on the system. The order is the same as with `ifconfig`. If no interfaces are up, then the first non-loopback interface is used. If no non-loopback interfaces are found, then the system is set to NON-NETWORKED.

- *value* – Specifies the particular interface by name. For example, *value* can be `le0` or `hme0`.

`base_config_sysidcfg_netmask`
The default value is `255.255.255.0`.

`base_config_sysidcfg_ipv6`
The value is either `yes` or `no`. If `yes`, IPv6 is to be used.

The default value is `no`.

`base_config_sysidcfg_defaultroute`
You must set this parameter to the IP address, `none`, `auto`, or `findone`.

- **IP address** – Specify the IP address of the default *router*.
- `none` – Specify no default router. This keyword is supported starting with the Solaris 9 release.
- `auto` or `findone` – Attempt to find a default router that broadcasts itself.

The default value is `none`.

`base_config_sysidcfg_systemlocale`
Specify the locale to use on the managed host. See the subdirectories in `/usr/lib/locale` for valid locale values.

The default value is `C`.

`base_config_sysidcfg_terminal`
Specify the terminal type to use on the managed host. See the subdirectories in `/usr/share/lib/terminfo` for valid terminal values.

The default value is `vt100`.

`base_config_sysidcfg_timezone`
Specify the time zone to use for the managed host. See the directories and files in `/usr/share/lib/zoneinfo` for valid time zone values. The time zone value is the name of the path relative to the `/usr/share/lib/zoneinfo` directory. For example, the time zone value for mountain standard time in the United States is `US/Mountain`. The time zone value for Japan is `Japan`. You can also specify any valid Olson time zone.

`base_config_sysidcfg_timeserver`
Optionally set a time server, which defaults to `localhost`. If you specify `localhost` as the time server, the system's time is assumed to be correct. To specify a time server when you are not running a naming service, specify the fully qualified host name or IP address of the system.

The default value is `localhost`.

`base_config_sysidcfg_security_policy`
Determine which security policy to use. Set to `none`, the default, if there no security policy. Set to `kerberos` to use *Kerberos security*.

If you use Kerberos security, you must specify values for the following parameters:

- `base_config_sysidcfg_default_realm`
- `base_config_sysidcfg_admin_server`
- `base_config_sysidcfg_kdc`

`base_config_sysidcfg_default_realm`

If the value for `base_config_sysidcfg_security_policy` is `kerberos`, specify the *Kerberos default realm*. The default realm must be a fully qualified domain name.

`base_config_sysidcfg_admin_server`

If the value for `base_config_sysidcfg_security_policy` is `kerberos`, specify the *Kerberos admin server*. The admin server must be a fully qualified domain name.

`base_config_sysidcfg_kdc`

If the value for `base_config_sysidcfg_security_policy` is `kerberos`, specify a comma-separated list of fully qualified *Kerberos key distribution center* host names. The list must contain at least one key distribution center.

Disk Layout Parameters

The following parameters specify how to lay out the disks of the managed host. The parameters that describe the device names and slice sizes must be specified in `filesys` keyword format for custom JumpStart. For information about the `filesys` custom JumpStart keyword, see “Custom JumpStart (Reference)” in *Solaris 9 Installation Guide*.

Note – The value for *size* can only be *num*, in Mbytes, or *slice:size*, in cylinders, for Solaris Flash installations.

`base_config_be_0_root_device`

The device name of the main boot environment’s root slice.

`base_config_be_0_root_size`

The size of the main boot environment’s root slice.

`base_config_be_0_swap_device`

The device name of the main boot environment’s swap slice.

`base_config_be_0_swap_size`

The size of the main boot environment’s swap slice.

`base_config_be_0_usr_device`

The device name of the main boot environment’s `/usr` slice.

`base_config_be_0_usr_size`

The size of the main boot environment’s `/usr` slice.

`base_config_be_0_var_device`
The device name of the main boot environment's /var slice.

`base_config_be_0_var_size`
The size of the main boot environment's /var slice.

`base_config_be_0_opt_device`
The device name of the main boot environment's /opt slice.

`base_config_be_0_opt_size`
The size of the main boot environment's /opt slice.

`base_config_be_1_root_device`
The device name of the alternate boot environment's root slice.

`base_config_be_1_root_size`
The size of the alternate boot environment's root slice.

`base_config_be_1_swap_device`
The device name of the alternate boot environment's swap slice.

`base_config_be_1_swap_size`
The size of the alternate boot environment's swap slice.

`base_config_be_1_usr_device`
The device name of the alternate boot environment's /usr slice.

`base_config_be_1_usr_size`
The size of the alternate boot environment's /usr slice.

`base_config_be_1_var_device`
The device name of the alternate boot environment's /var slice.

`base_config_be_1_var_size`
The size of the alternate boot environment's /var slice.

`base_config_be_1_opt_device`
The device name of the alternate boot environment's /opt slice.

`base_config_be_1_opt_size`
The size of the alternate boot environment's /opt slice.

`base_config_local_swapx_device`
The device name of the swap slice. This swap slice can be shared among boot environments.

`base_config_local_swapx_size`
The size of the swap slice. This swap slice can be shared among boot environments.

`base_config_local_mntx_device`
The physical device for the local mount *x*.

`base_config_local_mntx_mtpt`
The mount location for the local mount *x*.

`base_config_local_mntx_options`
The mount options for the local mount *x*.

`base_config_local_mntx_size`
The size for the local mount *x*.

`base_config_remote_mntx_mtpt`
The mount location for the remote mount *x*.

`base_config_remote_mntx_hostname`
The name of the remote system that has the file system to be mounted for the remote mount *x*.

`base_config_remote_mntx_hostaddress`
The IP address of the *host* that has the file system to be mounted for the remote mount *x*.

`base_config_remote_mntx_path`
The path on the remote system to be mounted for the remote mount *x*.

`base_config_remote_mntx_options`
The mount options for the remote mount *x*.

Minimum Set of Parameters to Deploy Software

The following table describes the minimum set of parameters you must specify to be able to deploy software to a managed host. To configure your managed hosts for reinstallation, configure one boot environment. To configure your managed hosts for update, configure two boot environments.

One Boot Environment	Two Boot Environments
base_config_target_arch	base_config_target_arch
base_config_target_ether_addr	base_config_target_ether_addr
base_config_flar_archive	base_config_flar_archive
base_config_sysidcfg_rootpw	base_config_sysidcfg_rootpw
base_config_sysidcfg_networkinterface	base_config_sysidcfg_networkinterface
base_config_local_swap1_device	base_config_local_swap1_device
base_config_local_swap1_size	base_config_local_swap1_size
base_config_be_0_root_device	base_config_be_0_root_device
base_config_be_0_root_size	base_config_be_0_root_size
	base_config_be_1_root_device
	base_config_be_1_root_size

Auditing Software Configurations (Reference)

This chapter describes the file formats for the three audit-related files.

The following topics are described in this chapter:

- “Audit Rules File Format” on page 177
- “Manifest File Format” on page 181
- “Comparison Report Format” on page 184

Audit Rules File Format

The rules file is a text file that is used by the audit commands. The rules file determines which files to validate and which file attributes of those files to ignore.

To create an audit rules file, see “How to Create an Audit Rules File (Web Browser)” on page 103 and “How to Import an Audit Rules File to the Change Manager Repository (Web Browser)” on page 104 or “How to Import Audit Rules Files to the Change Manager Repository (Command Line)” on page 112.

Some lines are ignored by the manifest comparison tool. Ignored lines include blank lines, lines that consist only of white space, and comments that begin with #.

The rules file supports three directives: `CHECK`, `IGNORE`, and a subtree directive, which is an absolute path name plus optional pattern matching modifiers. The rules file uses the directives to create logical blocks.

Syntax

The syntax for the rules file is as follows:

```

[IGNOREattribute...]*
[CHECK] [attribute...] *

subtree1 [pattern...]*
[IGNORE attribute...]*
[CHECK] [attribute...] *

subtree2 [pattern...]*
subtree3 [pattern...]*
subtree4 [pattern...]*
[IGNORE attribute...]*
[CHECK] [attribute...] *
...

```

Rule Blocks

Rule blocks are composed of statements that are created by using directives and arguments. There are three types of blocks.

Global block	The first block in the file. The block is considered “global” if it specifies CHECK and IGNORE statements, but no previous subtree statement. A global block pertains to all subsequent blocks.
Local block	A block that specifies CHECK and IGNORE statements as well as a subtree directive. The rules in this block pertain to files and directories found in the specified subtree.
Heir block	A block that contains a null CHECK statement, no arguments. This block inherits the global CHECK statements and global IGNORE statements.

Note – The order in which CHECK and IGNORE statements appear in blocks is important. The CHECK and IGNORE statements are processed in the order in which they are read, with later statements overriding earlier statements.

Subtree specifications must appear one per line. Each specification must begin with an absolute path name. Optionally, each specification can be followed by pattern-matching arguments.

When a file being tracked belongs to more than one subtree directive, the resolution is performed by doing the following:

- Applying the CHECK and IGNORE statements set in a global block. Note that all CHECK and IGNORE statements are processed in order.
- Finding the last subtree directive that matches the file.

- Processing the CHECK and IGNORE statements that belong to the last matching subtree directive. These statements are processed in the order in which they are read, overriding global settings.

Pattern Matching Statements

The syntax for the audit rules file enables you to perform ANDing and ORing operations.

AND Statement

For a given subtree directive, all pattern matching statements are logically ANDed with the subtree. Patterns have the following syntax:

- Wildcards are permitted for both the subtree and pattern matching statements.
- The exclamation point (!) character represents logical NOT.
- A pattern that terminates with a slash is a subtree. The absence of a slash indicates that the pattern is not a directory. The subtree itself does not require an end slash.

For example, the following subtree example includes the contents of `/home/nickiso/src` except for object files, core files, and all of the SCCS subtrees. Note that directory names that terminate with `.o` and directories named `core` are *not* excluded because the patterns specified do not terminate with `/`.

```
/home/nickiso/src !*.o !core !SCCS/
CHECK    all
```

OR Statement

Group multiple subtree directives together. Such subtree directives are logically ORed together.

```
/home/nickiso/src !*.o !core
/home/nickiso/Mail
/home/nickiso/docs *.sdw
CHECK    all
IGNORE   mtime lnmtime dirmtime
```

The files included in the previous example are as follows:

- Everything under `/home/nickiso/src` except for `*.o` and `core` files
- Everything under `/home/nickiso/Mail`
- All files under `/home/nickiso/docs` that end in `*.sdw`

For these files, all attributes are checked except for modification times.

File Attributes

The audit rules file uses CHECK and IGNORE statements to define which attributes to track or ignore. Each attribute has an associated keyword.

The attribute keywords are as follows:

- acl
- all
- contents
- dest
- devnode
- dirmtime
- gid
- lnmtime
- mode
- mtime
- size
- type
- uid
- xattrs

The all keyword refers to all file attributes. See “Manifest File Format” on page 181.

Rules File Example

```
# Global rules, track everything except dirmtime.
CHECK    all
IGNORE    dirmtime

# The files in /data* are expected to change, so don't bother
# tracking the attributes expected to change.
# Furthermore, by specifying "IGNORE contents," you save
# time and resources.
/data*
IGNORE    contents mtime size

/home/nickiso f* bar/
IGNORE    acl

# For /usr, apply the global rules.
/usr
CHECK

# Note: Since /usr/tmp follows the /usr block, the /usr/tmp
# subtree is subjected to the "IGNORE all."
/usr/tmp
/home/nickiso *.o
/home/nickiso core
```

```
/home/nickiso/proto
IGNORE      all
```

The following files are cataloged based on the sample rules file:

- All attributes, except for `dirmtime`, `mtime`, `size`, and `contents`, are tracked for files under the `/data*` subtrees.
- Files under the `/usr` subtree, except for `/usr/tmp`, are cataloged by using the global rules.
- If the `/home/nickiso/foo.c` file exists, its attributes, except for `acl` and `dirmtime`, are cataloged.
- All `.o` and `core` files under `/home/nickiso`, as well as the `/home/nickiso/proto` and `/usr/tmp` subtrees, are ignored.
- If the `/home/nickiso/bar/foo.o` file exists, it is ignored because it is subject to the last block.

Manifest File Format

The software audit generates a manifest that describes the contents of a managed host. A manifest consists of a header and entries. Each entry represents a single file. Entries are sorted in ascending order by file name. Any nonstandard file names, such as those that contain embedded newline or tab characters, have the special characters quoted prior to being sorted. See “Quoting Syntax” on page 183.

Lines that begin with `!` supply metadata about the manifest. The manifest version line indicates the manifest specification version. The date line shows the date on which the manifest was created, in `date(1)` form.

Some lines are ignored by the manifest comparison tool. Ignored lines include blank lines, lines that consist only of white space, and comments that begin with `#`.

In addition to metadata lines, the header contains the format comment block. This comment block lists the attributes reported for each file type.

To see the format of a manifest, see “Manifest Output Example” on page 183.

Manifest File Entries

Each manifest file entry is a single line of one of the following forms, depending on the file type:

```

fname D size mode acl dirmtime uid gid [xattr xcontents] *
fname P size mode acl mtime uid gid [xattr xcontents] *
fname S size mode acl mtime uid gid [xattr xcontents] *
fname F size mode acl mtime uid gid contents [xattr xcontents] *
fname L size mode acl lnmtime uid gid dest [xattr xcontents] *
fname B size mode acl mtime uid gid devnode [xattr xcontents] *
fname C size mode acl mtime uid gid devnode [xattr xcontents] *

```

Each entry begins with *fname*, which is the name of the file. To prevent parsing problems that are caused by special characters embedded in file names, file names are encoded as described in “Quoting Syntax” on page 183.

Subsequent fields represent the following file attributes:

<i>type</i>	Type of file. Possible values are as follows: <ul style="list-style-type: none"> ■ B for a block device node ■ C for a character device node ■ D for a directory ■ F for a file ■ L for a symbolic link ■ P for a pipe ■ S for a socket
<i>size</i>	File size in bytes.
<i>mode</i>	Octal number that represents the permissions of the file.
<i>acl</i>	ACL attributes for the file. For a file with ACL attributes, this field contains the output from <code>acltotext()</code> .
<i>uid</i>	Numerical user ID of the owner of this entry.
<i>gid</i>	Numerical group ID of the owner of this entry.
<i>dirmtime, lnmtime, mtime</i>	Last modification time, in seconds since 00:00:00 UTC, January 1, 1970, for directories, links, and other files, respectively.
<i>contents</i>	Checksum value of the file. This attribute is only specified for regular files. If you turn off context checking or if checksums cannot be computed, the value of this field is <code>-</code> .
<i>dest</i>	Destination of a symbolic link.
<i>devnode</i>	Value of the device node. This attribute is for character device files and block device files only.
<i>[xattr xcontents]*</i>	Zero or more checksum values for files with extended attributes. The attributes are described in alphabetical order. If the <code>-n</code> option or the <code>IGNORE contents</code> directive is specified, the value of <i>xcontents</i> is <code>-</code> .

Quoting Syntax

The rules file supports a quoting syntax for representing nonstandard file names.

When generating a manifest for file names that embed tab, space, or newline characters, the special characters are encoded in their octal forms.

The following table shows the quoted form of special characters.

Input Character	Quoted Character
(space)	\(space)
(tab)	\(tab)
(newline)	\(newline)
?	\?
[\[
*	*

Manifest Output Example

The following is a sample system manifest. The file entries are sorted by the encoded versions of the file names to correctly handle special characters.

```
! Version 1.0
! Mon Feb 11 10:55:30 2002
# Format:
# fname D size mode acl dirmtime uid gid [xattr xcontents]*
# fname P size mode acl mtime uid gid [xattr xcontents]*
# fname S size mode acl mtime uid gid [xattr xcontents]*
# fname F size mode acl mtime uid gid contents [xattr xcontents]*
# fname L size mode acl lnmtime uid gid dest [xattr xcontents]*
# fname B size mode acl mtime uid gid devnode [xattr xcontents]*
# fname C size mode acl mtime uid gid devnode [xattr xcontents]*
/etc D 3584 40755 user::rwx,group::r-x,mask::r-x,other::r-x, 3c6803d7 0 3
/etc/.login F 524 100644 user::rw-,group::r--,mask::r--,other::r--, 3c165878
0 3 27b53d5c3e844af3306f1f12b330b318
/etc/.pwd.lock F 0 100600 user::rw-,group::---,mask::---,other::---,
3c166121 0 0 d41d8cd98f00b204e9800998ecf8427e
/etc/.syslog_door L 20 120777 user::rw-,group::r--,mask::rwx,other::r--,
3c6803d5 0 0 /var/run/syslog_door
/etc/autopush L 16 120777 user::r-x,group::r-x,mask::r-x,other::r-x,
3c165863 0 0 ../sbin/autopush
/etc/cron.d/FIFO P 0 10600 user::rw-,group::---,mask::---,other::---,
3c6803d5 0 0
```

Comparison Report Format

The Audit command produces output that describes differences between two manifests on a per-file basis.

<i>filename</i>	
<i>attribute</i>	control:xxx test:yyyy
<i>filename</i>	Name of the file that differs between <i>control-manifest</i> and <i>test-manifest</i> . For file names that contain embedded whitespace or newline characters, see “Quoting Syntax” on page 183.
<i>attribute</i>	The name of the file attribute that differs between the manifests that are compared. <i>xxx</i> is the attribute value from <i>control-manifest</i> , and <i>yyy</i> is the attribute value from <i>test-manifest</i> . When discrepancies for multiple attributes occur for the same file, each difference is noted on a separate line.

The following default output shows the attribute differences for the `/etc/passwd` file. The output indicates that the `size`, `mtime`, and `contents` attributes have changed.

```
/etc/passwd:
size control:74 test:81
mtime control:3c165879 test:3c165979
contents control:daca28ae0de97afd7a6b91fde8d57afa
test:84b2b32c4165887355317207b48a6ec7
```


Navigating Through the Change Manager Browser Interface (Reference)

This appendix describes how to navigate through the Change Manager browser interface and covers the following navigation topics:

- “General Change Manager Links Area” on page 185
- “Navigation Bread Crumbs” on page 192
- “Drop-Down Menus” on page 193
- “Guidelines for Navigating Folders and Host Groups” on page 193
- “Guidelines for Navigating the Wizards” on page 194

General Change Manager Links Area

The *general links area* appears at the top of each page of the browser interface. The general links area contains Log Out and Help buttons and section tabs.

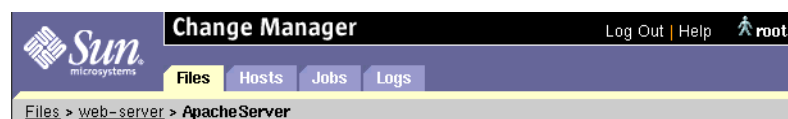


FIGURE A-1 Change Manager General Links Area and Bread Crumbs

Log Out and Help Buttons

These buttons appear on a *black* background:

- | | |
|----------------|--|
| Log Out | Exit Change Manager and return to the login page. |
| Help | Display help in a separate browser window. Help consists of a general Change Manager overview, a glossary of terms, and detailed help. |

Section Tabs

The tabs for the four sections appear on a *blue* background.

Files Manage the files needed for *deployment* tasks and *audit* tasks.

Files and folders are stored in the Change Manager repository, which is located on the Change Manager server.

You can arrange files in a hierarchy of folders. Files managed are Solaris Flash archives, Solaris boot images, manifests, audit rules files, shared profiles, and reports.



FIGURE A-2 Change Manager Files Section

You can perform the following actions in the Files section:

- Create folders, shared profiles, and audit rules files.
- Import Solaris Flash archives, Solaris boot images, shared profiles, manifests, and audit rules files to the repository.
- Rename a file or folder.
- Export a file from the repository.
- Move files and folders to another folder.
- Create a copy of a shared profile or an audit rules file in the current folder.

- Delete files and folders.
- View and modify file properties and property values.
- View folder contents.

Hosts Manage host groups and managed hosts. You can arrange managed hosts in a hierarchy of host groups. This hierarchy can be in an administrative domain that you create by using Sun Management Center.



FIGURE A-3 Change Manager Hosts Section

You can perform the following actions in the Hosts section:

- Optionally select an administrative domain.

Note – Administrative domains are created and managed by the Sun Management Center application. When using the Change Manager, you can only select from existing administrative domains.

- Create host groups.
- Add managed hosts with specific properties.
- Import one or more hosts simultaneously by means of a file that contains host names and host property values.
- Rename a managed host or host group.
- Copy a managed host to another host group.
- Move managed hosts and host groups to another host group.
- Remove managed hosts and host groups.
- View and modify managed host properties and property values.
- View host group contents.

Run deployment commands and audit commands on host groups and managed hosts from the Hosts section. Long-running operations, such as updates, imports, and exports, become jobs.

- Perform an initial installation of managed hosts.
- Update managed hosts.
- Reinstall managed hosts.
- Fall back to the previous boot environment.
- Build manifests for managed hosts.
- Audit managed hosts by comparing their manifests against a baseline manifest.
- Get the software status of managed hosts.
- Reboot managed hosts.
- Halt the operating system of managed hosts.

Jobs

View the status of current jobs and recent jobs in the *job queue*. A *job* is a task running on a managed host or on the Change Manager server. A job is initiated from the Files section or Hosts section of the browser interface. The queue shows the status of current jobs and recent jobs that have been submitted to run on managed hosts.



FIGURE A-4 Change Manager Job Queue

You can perform the following actions in the Jobs section:

- Cancel pending jobs or running jobs.
- Purge completed jobs from the job queue.

Logs View the job log and transaction log to diagnose failures. The log entries detail Change Manager operations. The *job log* shows jobs started, such as import, update, and audit. The *transaction log* shows all actions initiated by Change Manager.

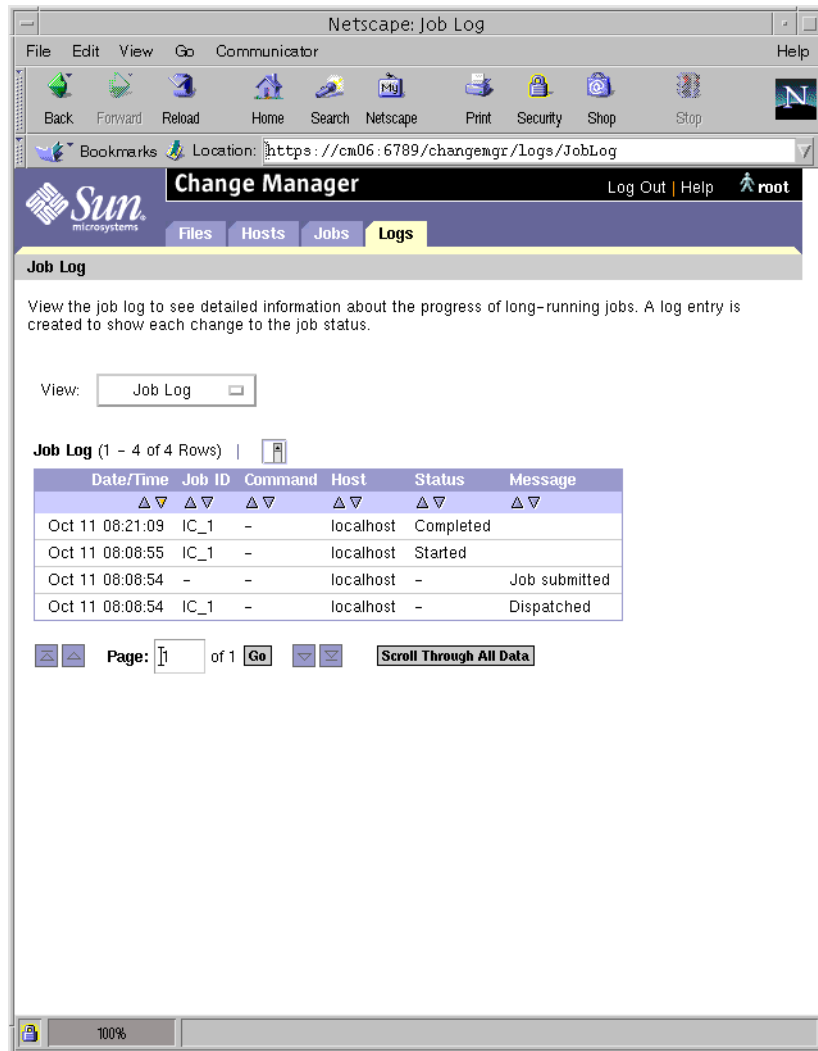


FIGURE A-5 Change Manager Job Log

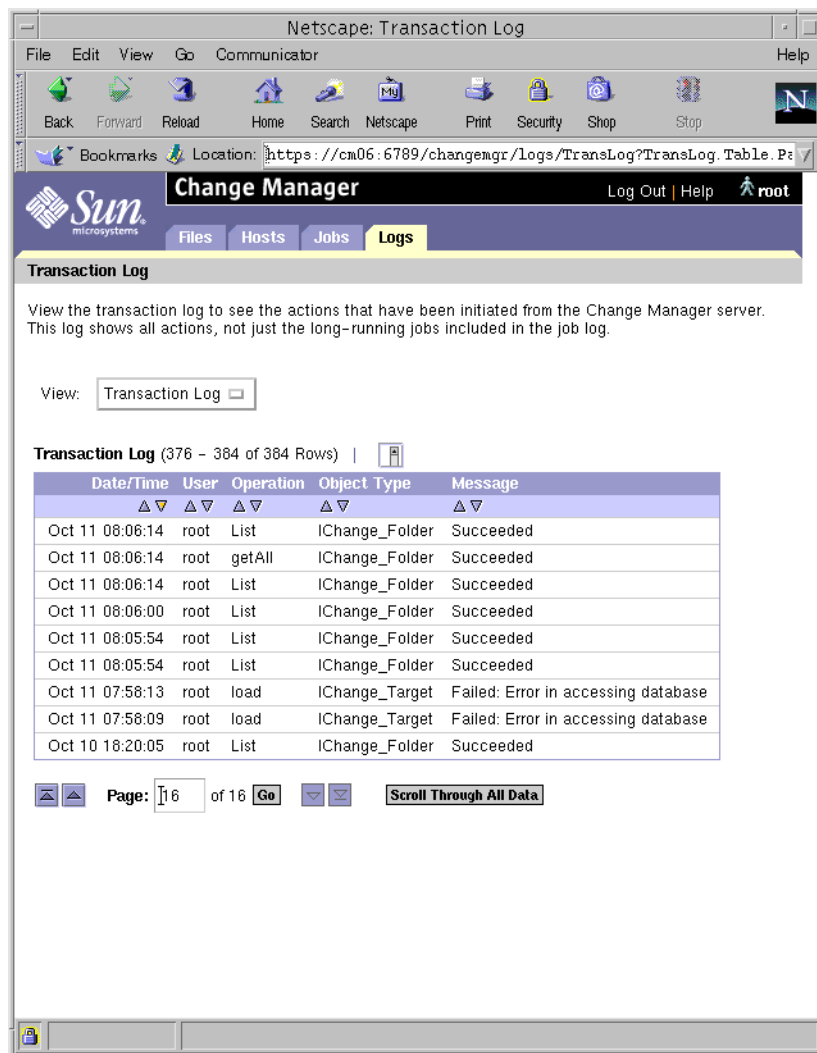


FIGURE A-6 Change Manager Transaction Log

Navigation Bread Crumbs

The bread crumbs appear on a *gray* background. The *bread crumbs* are links that

indicate the present location in the Change Manager folders and host groups. The underlined words in the bread crumbs are links. Click the links to go to the named folder or host group.

Drop-Down Menus

The pages in the Files, Hosts, and Jobs sections, as well as some property pages, have drop-down menus.

- When you select actions from the Actions drop-down menus, *action pages* appear. You specify information on the action pages to perform various actions.
 - The Jump To menus take you to another part of the current page.
-

Guidelines for Navigating Folders and Host Groups

Information that is managed from the Files section is organized hierarchically by means of *folders*. Information that is managed from the Hosts section is organized hierarchically by means of *host groups*. Click a folder name or a host group name to change to that folder or host group and view its contents. Click a file name or a managed host's name to view its properties.

- Use folders to organize Change Manager file *objects*, such as Solaris Flash archives, manifests, and audit rules files.
- Use host groups to organize related managed hosts. The same managed host can be in several host groups. Initiate tasks by selecting particular managed hosts or by selecting host groups.

To perform an action on particular items, do the following:

- Select the item by clicking the checkbox next to its name.
- Choose the action from the Actions drop-down menu.

Guidelines for Navigating the Wizards

The Change Manager uses *wizards* to create shared profiles. A wizard steps you through to the completion of a task. Click these buttons to perform the following actions:

Back	Return to the previous page of the wizard.
Browse	Launch a file chooser window to search for files or directories on the Change Manager server or on other systems on the network.
Cancel	Exit the wizard. No shared profile or host properties are created.
Finish	Create the shared profile or host properties based on the parameter values.
Help	Get page-specific help. The help appears in the left <i>panel</i> of the wizard. The help panel replaces the list of steps.
Next	Go to the next page of the wizard.
Steps	View the steps used to create a shared profile or host properties. The steps appear in the left panel of the wizard, which is also used to display help.

Troubleshooting (Tasks)

This appendix lists problems, warning messages, and error messages that you might see when using Change Manager.

The information for each problem can include three sections:

- **Description** – The description section describes the problem. If necessary, warning messages and error messages are included.
- **Cause** – The cause section, when applicable, describes the reason the problem occurred.
- **Solution** – The solution section describes the steps you must take to correct the problem.

Troubleshooting information is provided for the following problem areas:

- “Change Manager Server Installation Problems” on page 195
- “User Interface Problems” on page 196
- “Software Deployment Problems” on page 202

For problems that have been discovered since the publication of this book, see the *Sun Management Center Change Manager 1.0 Release Notes*.

Change Manager Server Installation Problems

The following troubleshooting issues relate to the installation of Sun Management Center 3.0 and Change Manager 1.0 on the designated Change Manager server.

patchadd -p Issues PatchArrElem Error on Solaris 8

/usr/sbin/patchadd[177]: PatchArrElem: subscript out of range

Description: This message appears when you run the patchadd -p command on the Solaris 8 2/02 operating environment.

Solution: You can ignore this message.

To avoid seeing this message, add patch 108987-09 to your Solaris 8 2/02 system.

1. **Become superuser.**
2. **Download the patch to your system from the SunSolve Patch Portal.**
3. **Use the unzip command to expand the patch from the ZIP archive.**

```
# unzip 108987-09.zip
```

4. **Change to the patch directory.**

```
# cd 108987-09
```

5. **Install the patch.**

```
# patchadd `pwd`/108987-09
```

User Interface Problems

This section describes problems using the browser interface and the command-line interface. Problems seen when using both user interfaces are described first.

General User Interface Problems

Managed Host Not Added Error Appears When You Try to Add a New Host

Description: You attempt to add a new host, and the following message appears:

```
Managed Host Not Added
SNMP request returned error status 6 (no access)
snmp://129.153.72.86:164/mod/topology+view-#/entityAdder#0
```

Other similar types of requests might yield a similar error.

Solution: Ensure that you are an authorized Sun Management Center domain administrator by ensuring that you are a member of both the esadm and esdomadm groups.

Internal error: unable to establish probe connection Appears When Running Jobs on Managed Hosts

Internal error: unable to establish probe connection

Description: This message appears when you run jobs on a managed host that is a client of more than one Change Manager server.

Solution: Ensure that the managed host is a client of only one Change Manager server.

To change control of a managed host to another Change Manager server, perform the following steps:

1. Remove the managed host from the current server.
2. Add the managed host to the new Change Manager server.
3. Create a shared profile for the managed host.
4. Run Set Up for Install or changemgr setup for the managed host.

Import of a Solaris Boot Image Fails (4733369)

Description: When you import a Solaris boot image, you might see the following error message:

```
Aug 29 10:03:27 IC_1 - -  
Failed [Execution failed [import failed: ]]
```

This error might indicate that the disk is full.

Solution: Check to see if the file system that contains the Change Manager repository is full.

Import of Shared Profile Fails if Specified Solaris Flash Archive Does Not Exist in the Repository (4738382)

Description: If you import a shared profile in to the repository and the operation fails, you might see the following error message:

```
Execution failed [import failed: record not found:
/archive_name.flar]
/templ_name.cmsp: import failed.
```

- Cause:** Change Manager validates the archive specified in the shared profile. If the archive is invalid (it does not exist), then the import fails.
- Solution:** Make sure that the Solaris Flash archive exists in the repository before importing the shared profile.

File copy did not run Error Message Issued During Import Operation (4753374)

- Description:** When you perform an import operation, you might see the following error message:
- ```
File copy did not run
```
- This error message might indicate that /tmp is full.
- Solution:** Free space in /tmp to make room for the file you want to import.

## Browser Interface Problems

The following troubleshooting issues relate to the browser interface.

### Unable to Reach the Change Manager Login Page

- Description:** You provide the correct Change Manager URL, but you are unable to reach the login page. Following is the correct form of the URL:
- ```
https://server_name.domain:6789/changemgr
```
- Solution:** Try restarting the web server by typing:
- ```
/usr/sadm/bin/smcwebserver restart
```

### Unable to Log In to the Change Manager Browser Interface With Valid User Name and Password

- Description:** You type a valid Change Manager user name and password on the Change Manager login page, but the login attempt fails.
- Solution:** Try restarting the Sun Management Center server by typing:

```
/opt/SUNWsymon/sbin/es-restart -A
```

## Change Manager Does Not Appear in the Application List or Not Authorized to Use Requested Application Is Displayed When You Try to Log In

**Description:** You provide a valid Solaris user name and password, but are unable to start the Change Manager application.

**Solution:** Ensure that you are an authorized Sun Management Center user by inspecting the file `/var/opt/SUNWsymon/cfg/esusers`.

---

**Note** – To access all areas of Change Manager, you need to be an authorized Sun Management Center domain administrator. Ensure that you are a member of both the `esadm` and `esdomadm` groups.

---

## document contained no data Error Appears When Trying to Access the Change Manager URL

**Description:** You provide the correct Change Manager URL, but the following error message appears in a dialog box:

```
document contained no data.
```

**Solution:** Verify that the URL is correct.

The following example shows the correct form of the Change Manager URL:

```
https://server_name.domain:6789/changemgr
```

Ensure that the URL begins with `https`, not `http`.

If the URL is correct, try restarting the web server by typing:

```
/usr/sadm/bin/smcwebserver restart
```

## Netscape Communicator Reports That Certificate Has an Invalid Signature

The server's certificate has an invalid signature. You will not be able to connect to this site securely.

**Solution:** Restart the Netscape Communicator, then access the page again.

## The Browser Interface Behaves Unpredictably When Handling Large Numbers of Host Groups (4685706, 4707804, 4738647)

**Description:** When a large number of host groups, namely, 200, are manipulated, the browser interface might behave unpredictably. This situation occurs when creating large numbers of host groups or renaming a host group that contains a large number of host groups.

**Solution:** Avoid creating a topology hierarchy with large numbers of host groups.

If the browser interface becomes unusable, restart the Sun Management Center server and the web server by running:

```
/opt/SUNWsymon/sbin/es-restart -S
/usr/sadm/bin/smcwebserver restart
```

If restarting the Sun Management Center server and web server fails, you might want to reinitialize the Sun Management Center database.



---

**Caution** – Reinitializing the database removes all the topology and Change Manager data from the Change Manager server. So, use this only as a last resort.

---

1. Remove the data and recreate the Sun Management Center database.

```
/opt/SUNWsymon/sbin/es-setup -F
```

2. Recreate the Change Manager database.

```
/opt/SUNWsymon/sbin/es-setup -p ichange
```



## Cannot Browse Directories in the File Chooser Wizards That Are Not Publicly Readable (4735785)

**Description:** The browser interface cannot display the contents of directories that are not publically readable. This problem prevents the file browser from accessing private directories even though the user has appropriate permissions.

**Solution:** Directly specify files in such a directory by supplying a full path name to the file.

## Command-Line Interface Problems

The following troubleshooting issues relate to the command-line interface.

### Cannot Use the Command-Line Interface to Create Shared Profiles

**Description:** You cannot use the command-line interface to create a shared profile.

**Solution:** To create a shared profile, do one of the following:

- Create a shared profile by using the browser interface, see “How to Create a Shared Profile (Web Browser)” on page 77.
- Import an existing shared profile to the repository:
  - Create a shared profile outside of the repository. The shared profile is a text file that contains the parameters and parameter values described in “Parameters Used by Shared Profiles and Host Properties” on page 169.
  - Import the shared profile to the repository. See “How to Import Shared Profiles to the Change Manager Repository (Command Line)” on page 88.

After the shared profile is in the repository, you can modify property values by using the `changemgr filesset` command. See “How to Modify File or Folder Properties (Command Line)” on page 145.

---

# Software Deployment Problems

The following troubleshooting issues relate to the deployment of software to managed hosts.

## Custom JumpStart Installation Launches the Interactive Installation Program

**Description:** If the installation program detects an invalid parameter or parameter value in a shared profile or in host properties, the hands-off installation terminates. Then, the interactive installation program launches so you can correct the problem or otherwise continue with the installation.

This scenario occurs if you provide an invalid parameter value. For information about custom JumpStart keywords, see “Preconfiguring System Configuration Information (Tasks)” in *Solaris 9 Installation Guide*.

---

**Note –** The custom JumpStart keywords correspond to the Change Manager parameters, but the names are different. The Change Manager parameters begin with the `base_config_string`, but the content part of the string matches closely to the custom JumpStart keyword names. To see a description of the Change Manager parameters, see Chapter 10.

---

**Cause:** The installation program detects the parameter problem, but cannot correct it. The custom JumpStart installation cannot continue, so it launches the interactive installation program.

**Solution:** To correct the problem, review the parameters and parameter values for the managed host that failed to perform the custom JumpStart installation.

Ensure that the parameters and parameter values are correct. See Chapter 10 for a description of the parameters specified in shared profiles and by host properties.

---

**Note** – Be careful when copying the encrypted root password from `/etc/shadow` to the shared profile. Do not include the colon (:) field delimiters as part of the `base_config_sysidcfg_rootpw` property value.

---

If you find the problem and correct it, restart the initial installation.

If you do not find the problem, review the parameters and parameter values in the shared profile or in the host properties.

---

**Note** – If you are installing only one managed host, you might continue with the interactive installation. This solution is not advisable unless you are installing just one managed host with a simple software stack.

---

## Managed Host Hangs While Booting From the Network (4656587)

- Description:** While loading the bootstrap, the managed host hangs. You can tell when the bootstrap is being loaded because of the hex count to 24000.
- This problem might occur more often when the network is heavily loaded.
- Cause:** An `in.tftpd` bug causes this intermittent failure. As a result of this bug, the transfer hangs.
- Solution:** Reset the hanged managed host. Try the network boot again.

## Panic: unable to mount file systems Message Appears While Booting From the Network

- Description:** The network boot of your managed host might fail with an error message such as:

```
Panic: unable to mount file systems
```

If such a message appears, then your managed host is probably being served by more than one network boot server.

You must first identify all network boot servers on which your managed host is registered, other than the Change Manager server.

**Solution:**

Use the `hostconfig(1M)` command to identify the network boot servers on which your managed host is a client.

Perform the following steps to determine whether your managed host is a client of more than one network boot server:

1. Remove your managed host from the Change Manager server from which you *want* to boot.
  - a. Use the browser interface or the command-line interface to remove your managed host from the Change Manager topology.
  - b. Log in to the boot server as superuser.
  - c. Change to the `Tools` directory of the Solaris boot image associated with the Solaris version you want to install.
  - d. Run the `rm_install_client` command to remove the entries for your managed host from the `/etc/bootparams` file.

```
./rm_install_server hostname
```

2. Run the `hostconfig` command to determine whether your managed host is a client of another network boot server.

```
$ hostconfig -p bootparams -f hostname -n -v
```

3. See if the `hostconfig` command identifies a network boot server for your managed host.

- If an IP address appears in square brackets on the first line of output, your managed host is a client of another boot server. The IP address represents the boot server.

```
From [192.153.72.132]: hostname = host1
ypdomain = yourCompany.COM
router = 192.153.72.1
```

- If no IP address appears, then your managed host is not a client of a boot server. Go to Step 7.

4. Determine the name of the boot server specified by the IP address.

If you use the NIS naming service, for example, use `ypmatch(1)` to associate the IP address with the host name of the boot server.

```
$ ypmatch 192.153.72.132 hosts.byaddr
129.153.72.132 cmserver
```

5. Repeat Step 1b to Step 4 to remove your managed host entries from the `/etc/bootparams` file on the boot server.
6. Repeat Steps 2-4 to find additional boot servers.
7. When no more boot servers are indicated by the `hostconfig` command, add your managed host to the Change Manager topology of the Change Manager server. Set up the files for installation. Then, restart the boot net - install from your managed host's console.

## Interactive Installation Program Launched When Files For Non-Existent Managed Hosts Not Cleaned Up (4721489)

**Description:** When the last reference to a managed host is removed from the Change Manager topology, the custom JumpStart data is not deleted.

The `/etc/bootparams` file still contains entries corresponding to the managed hosts.

The `/var/opt/ichange/jsdata/hostname` directories still contain boot environment information and custom JumpStart configuration files.

Extraneous `/etc/bootparams` entries for a managed host can cause problems. For example, if more than one Change Manager server has the same managed host registered, each server answers the call from that managed host. This situation produces excess traffic and unknown results on the managed host.

**Solution:** Manually clean up the following files on the Change Manager server:

- Find a Solaris miniroot, which might be located in the Change Manager repository under `/var/opt/ichange/root`. Change directory to the Tools subdirectory, for example, `/var/opt/ichange/root/s9.miniroot/Solaris_9/Tools`. Then, as superuser, type:
 

```
./rm_install_client hostname
```
- Delete the host-specific directories from the `/var/opt/ichange/jsdata` directory.



## Security (Reference)

---

You will likely use Change Manager on networks that are connected to the Internet. Therefore, security is key, especially in these areas:

- Identity
- Authentication
- Authorization
- Confidentiality
- Integrity
- Availability
- Accountability

This appendix describes the security issues that Change Manager addresses:

- “Users As Security Risks” on page 207
- “Secure Communication and File Transfer Channels” on page 208

---

## Users As Security Risks

The following users present different security risks for Change Manager:

- **Superuser on the Change Manager server** – Anyone with superuser privileges on the Change Manager server is trusted. If superuser privileges are penetrated, security is breached.
- **Authorized Users on the Change Manager server** – Authorized users are trusted because their access is controlled by Sun Management Center’s access control lists. Change Manager does not provide direct tools for managing these lists. Change Manager also does not provide mechanisms for protecting one user’s Change Manager data and managed hosts from another authorized user.

- **Other users on the Change Manager server** – Other users that are logged in to the Change Manager server are not trusted. These users are not permitted to take unauthorized actions, nor are they permitted to see unauthorized data.
  - **Superuser on managed hosts** – Anyone with superuser privileges on a managed host is trusted with respect to that managed host. If superuser privileges on a managed host are penetrated, security is breached on all managed hosts. Such a user must be prevented from using Change Manager to further penetrate the network.
  - **Other users on managed hosts** – Other users that are logged in to managed hosts are not trusted. These users are not permitted to take unauthorized actions, nor are they permitted to see unauthorized data.
  - **Users on other systems** – Users on systems that are not related to Change Manager are not trusted. These users must be prevented from taking unauthorized actions and seeing unauthorized data.
- 

## Secure Communication and File Transfer Channels

Change Manager uses secure communication and file transfer channels when available and as described for these security issues:

- Browser to User Interface
- Secure File Transfers
- User Interfaces to Change Manager Server
- Change Manager Data Storage
- Sun Management Center SNMP Control
- Using Sun Management Center Probe Connection to Retrieve Data From Managed Hosts
- Performing Initial Installations by Using RARP
- Performing Initial Installations by Using `bootparams`
- Performing Initial Installations by Using TFTP
- NFS Access by Managed Hosts
- Terminal Access

### Browser to User Interface

Communications between the browser and the browser user interface is achieved by using secure HTTP. Users are required to log in to the browser interface.



|                 |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
|-----------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Identity        | A user is identified by his or her UNIX user name. A server is identified by its host name.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
| Authentication  | User identity is initially proven using standard Solaris mechanisms. Subsequent transactions use reauthentication provided by the servlet session framework. Server identity is proven through the use of a self-signed certificate.                                                                                                                                                                                                                                                                                                                                                                                                                                            |
| Authorization   | <p>Authorization is performed by standard Sun Management Center mechanisms, as described in the <i>Sun Management Center 3.0 Software User's Guide</i>. These mechanisms offer per-user, per-operation control at the service level and per-user, per-operation, and per-target control at the agent level. Change Manager respects Sun Management Center authorization data, but does not provide a user interface mechanism to manipulate it.</p> <p>Only rudimentary control access to Change Manager data is currently supported. All users who are authorized to use a Change Manager service are able to access all Change Manager data associated with that service.</p> |
| Confidentiality | Secure HTTP mechanisms are used to encrypt traffic between the browser and the user interface.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
| Integrity       | The combination of encryption and authentication precludes productive corruption of the traffic.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
| Availability    | Flood attacks and corruption attacks can disrupt service. Underlying Solaris authentication mechanisms might optionally implement an authentication failure lockout policy. Such a lockout policy might enable denial of service attacks.                                                                                                                                                                                                                                                                                                                                                                                                                                       |
| Accountability  | Logins and user-level actions are logged.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |

## Secure File Transfers

The file import function is performed by using HTTP and traditional file system mechanisms. The file export function is performed by using traditional file system mechanisms. Using secure HTTP to perform file transfers is not planned at this time.

|                |                                                                                                                                                                                      |
|----------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Identity       | File system-based import and export functions use the user's UNIX identity. File imports that use HTTP are anonymous.                                                                |
| Authentication | No particular authentication is done as the user's UNIX identity is already authenticated. Note that file system mechanisms include NFS, and NFS authentication is notoriously weak. |
| Authorization  | File system access is performed by using the user's UNIX identity and by applying traditional file system access controls. HTTP access does not provide for authorization.           |

|                 |                                                                                                                                                                                                                              |
|-----------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Confidentiality | Local file system access is confidential. NFS access is likely to be exposed. HTTP access will be exposed.                                                                                                                   |
| Integrity       | Local file system access is considered trustworthy. NFS access is likely to be vulnerable to productive corruption. HTTP access is likely to be vulnerable to productive corruption.                                         |
| Availability    | Flood attacks and corruption attacks might disrupt service.                                                                                                                                                                  |
| Accountability  | User-level actions are logged by Change Manager. For local and NFS access, little or no logging is performed, although file ownership and timestamps provide some accountability. HTTP access provides very limited logging. |

## User Interfaces to Change Manager Server

The browser user interface and the command-line interface use Sun Management Center Remote Method Invocation (RMI) mechanisms to communicate with the server layer. Security issues are exactly as for Sun Management Center's other user interfaces.

|                 |                                                                                                                                                                                                                                                                                                                             |
|-----------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Identity        | UNIX user name.                                                                                                                                                                                                                                                                                                             |
| Authentication  | UNIX password.                                                                                                                                                                                                                                                                                                              |
| Authorization   | Authorization is performed by Sun Management Center service and agent authorization mechanisms.<br><br>Only rudimentary control access to Change Manager data is currently supported. All users who are authorized to use a Change Manager service are able to access all Change Manager data associated with that service. |
| Confidentiality | Traffic cannot be intercepted by applications such as snoop.                                                                                                                                                                                                                                                                |
| Integrity       | Traffic cannot be corrupted.                                                                                                                                                                                                                                                                                                |
| Availability    | Flood attacks might disrupt service. Underlying Solaris authentication mechanisms might optionally implement an authentication failure lockout policy. Such a lockout policy might enable denial of service attacks.                                                                                                        |
| Accountability  | Logins and user-level actions are logged.                                                                                                                                                                                                                                                                                   |

## Change Manager Data Storage

|                |                                                                                        |
|----------------|----------------------------------------------------------------------------------------|
| Identity       | UNIX user name.                                                                        |
| Authentication | This issue is covered by other areas. The authenticated UNIX user identity is trusted. |

|                 |                                                                                                                                                                                                                                                                                                                                                                                                                           |
|-----------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Authorization   | <p>Standard file system access controls are used to prevent unauthorized access to Change Manager data files. Files and directories are owned by superuser and are not publically readable or writable.</p> <p>Standard Sun Management Center and Oracle access controls are used to prevent unauthorized access to Change Manager database contents.</p> <p>Note that NFS allows some access to Change Manager data.</p> |
| Confidentiality | Files are protected as described for Authorization.                                                                                                                                                                                                                                                                                                                                                                       |
| Integrity       | Local file access is considered to be trustworthy.                                                                                                                                                                                                                                                                                                                                                                        |
| Availability    | Denial of service through disk space exhaustion is a possible issue. In such cases, the user is advised to locate Change Manager data on a dedicated file system that does not allow access by ordinary users.                                                                                                                                                                                                            |
| Accountability  | Only standard file system ownership mechanisms are provided to address accountability.                                                                                                                                                                                                                                                                                                                                    |

## Sun Management Center SNMP Control

|                 |                                                                                                                                                                                      |
|-----------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Identity        | Same as for Sun Management Center.                                                                                                                                                   |
| Authentication  | Same as for Sun Management Center and SNMPv2usec.                                                                                                                                    |
| Authorization   | Same as for Sun Management Center. Per-user, per-target, and per-operation ACLs are respected, although the Change Manager user interface does not offer a mechanism to manage them. |
| Confidentiality | Same as for Sun Management Center.                                                                                                                                                   |
| Integrity       | Same as for Sun Management Center.                                                                                                                                                   |
| Availability    | Flood attacks and corruption attacks might disrupt service.                                                                                                                          |
| Accountability  | Same as for Sun Management Center.                                                                                                                                                   |
|                 | Managed hosts log all actions.                                                                                                                                                       |

## Using Sun Management Center Probe Connection to Retrieve Bulk Data From Managed Hosts

Change Manager uses a private protocol between the Sun Management Center server and agent to perform particular management operations. This protocol relies on a Sun Management Center “probe connection,” which provides a data stream between server and agent. The probe mechanism relies on standard Sun Management Center authentication to ensure proper access to the Change Manager components on the agent. The agent must be properly configured and must be in the appropriate server context before a probe connection can be established.

|                 |                                                                                                                                                                                                                                                                                                                                                                                                                                  |
|-----------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Identity        | The server and the agent are in a “trusted” relationship according to Sun Management Center server context security.                                                                                                                                                                                                                                                                                                             |
| Authentication  | The user must be authorized on the server. An interloper might eavesdrop on the initiation of the probe connection and grab credentials from the agent during initial handshake. This ability would allow unauthenticated access to the agent from a rogue server. Access by a rogue agent to server data through this mechanism is impractical, according to standard Sun Management Center server context security mechanisms. |
| Authorization   | An authenticated Sun Management Center user must have SNMP-set and SNMP-write access to the Change Manager Management Information Base (MIB). This access is managed by agent-side Access Control Lists (ACLs) according to Sun Management Center. The default access enables any authorized Change Manager user to have access to the Change Manager MIB.                                                                       |
| Confidentiality | Same as for Sun Management Center, which means little or no confidentiality.                                                                                                                                                                                                                                                                                                                                                     |
| Integrity       | Data is vulnerable to productive corruption attacks.                                                                                                                                                                                                                                                                                                                                                                             |
| Availability    | Flood attacks and corruption attacks might disrupt service. Service might be disrupted by unauthorized use of a snooped connection startup request. The interruption of Change Manager processes on an agent causes management operations to fail. Excessive system load or other resource constraints on an agent can affect Change Manager processes.                                                                          |
| Accountability  | Data transfers are logged by both the Change Manager server and the managed host, including managed host identification and the responsible user.                                                                                                                                                                                                                                                                                |

## Performing Initial Installations by Using RARP

Change Manager supports the standard Reverse Address Resolution Protocol (RARP) services for initial installations.

|                 |                                                                                                                                                                                                                                                                                                     |
|-----------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Identity        | MAC address.                                                                                                                                                                                                                                                                                        |
| Authentication  | None.                                                                                                                                                                                                                                                                                               |
| Authorization   | No authorization check is performed for the requesting client, which does not appear as a serious vulnerability.<br><br>No authorization check is done for the responding server, which is a potentially serious vulnerability as it might allow a rogue server to subvert an initial installation. |
| Confidentiality | None.                                                                                                                                                                                                                                                                                               |
| Integrity       | None.                                                                                                                                                                                                                                                                                               |
| Availability    | Flood attacks and corruption attacks might disrupt service.                                                                                                                                                                                                                                         |
| Accountability  | None.                                                                                                                                                                                                                                                                                               |

## Performing Initial Installations by Using bootparams

Change Manager supports the standard bootparams services for initial installations.

|                 |                                                                                                                                                                                                                                                                                                |
|-----------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Identity        | IP address.                                                                                                                                                                                                                                                                                    |
| Authentication  | None.                                                                                                                                                                                                                                                                                          |
| Authorization   | No authorization check is done for the requesting client, which does not appear as a serious vulnerability.<br><br>No authorization check is done for the responding server, which is a potentially serious vulnerability as it might allow a rogue server to subvert an initial installation. |
| Confidentiality | None.                                                                                                                                                                                                                                                                                          |
| Integrity       | None.                                                                                                                                                                                                                                                                                          |
| Availability    | Flood attacks and corruption attacks might disrupt service.                                                                                                                                                                                                                                    |
| Accountability  | None.                                                                                                                                                                                                                                                                                          |

## Performing Initial Installations by Using TFTP

|                 |                                                                                                                                                                                                                                                                                                                                                         |
|-----------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Identity        | None.                                                                                                                                                                                                                                                                                                                                                   |
| Authentication  | None.                                                                                                                                                                                                                                                                                                                                                   |
| Authorization   | <p>No authorization check is done for the requesting client, which does not appear as a serious vulnerability, as the only data transferred is a standard Solaris bootstrap.</p> <p>No authorization check is done for the supplying server, which is a potentially serious vulnerability as a rogue server could subvert the installation process.</p> |
| Confidentiality | None, which does not appear as a serious vulnerability, as the only data transferred is a standard Solaris bootstrap.                                                                                                                                                                                                                                   |
| Integrity       | None. Initial installation is vulnerable to productive corruption attacks.                                                                                                                                                                                                                                                                              |
| Availability    | Flood attacks and corruption attacks might disrupt service.                                                                                                                                                                                                                                                                                             |
| Accountability  | None.                                                                                                                                                                                                                                                                                                                                                   |

## NFS Access by Managed Hosts

|                 |                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
|-----------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Identity        | IP address.                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
| Authentication  | <p><b>Host</b> – None. The IP address is presumed trustworthy, which is a serious vulnerability as it might allow a villain using a spoofed IP address to retrieve sensitive data. Notably, if a managed host is enabled for initial installation, a villain might be able to retrieve a Solaris Flash archive.</p> <p><b>User</b> – Weak. The target is assumed trustworthy. A villain with superuser privileges on the target can retrieve potentially sensitive data.</p> |
| Authorization   | <p>By IP address, using NFS share restrictions.</p> <p>By standard file access controls.</p>                                                                                                                                                                                                                                                                                                                                                                                 |
| Confidentiality | None, which is a serious vulnerability, as on initial installation it might allow a villain to snoop retrieval of a Solaris Flash archive.                                                                                                                                                                                                                                                                                                                                   |
| Integrity       | None, which is a serious vulnerability as it might allow productive corruption attacks on both initial installation and update.                                                                                                                                                                                                                                                                                                                                              |
| Availability    | Flood attacks and corruption attacks might disrupt service.                                                                                                                                                                                                                                                                                                                                                                                                                  |
| Accountability  | None.                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |

## Terminal Access

Terminal access is not strictly a part of the Change Manager product. However, a user that accesses the Change Manager command-line interface through mechanisms such as `telnet`, `rlogin`, or `ssh` is vulnerable to all of the traditional vulnerabilities of those mechanisms.





# Glossary

---

The following terms are used throughout this document.

|                              |                                                                                                                                                                                                                                                                                                                                        |
|------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>ACL</b>                   | Access control list. A table that describes the access rights each user has to particular system objects, such as files and directories.                                                                                                                                                                                               |
| <b>action page</b>           | A page that appears when you select an action from one of the Actions drop-down menus in the browser interface. For example, if you select New Folder, the New Folder action page appears. On this action page, you type the name of the folder to create.                                                                             |
| <b>administrative domain</b> | A hierarchical collection of managed hosts and host groups. Host groups contain managed hosts and other host groups.                                                                                                                                                                                                                   |
| <b>agent seed</b>            | Seed value to authenticate the Change Manager server to the agents on managed hosts and vice versa.<br><br>The seed is an alphanumeric string of up to 8 characters. Be sure to record it for later reference.                                                                                                                         |
| <b>alert</b>                 | Graphic that indicates the status of an action.                                                                                                                                                                                                                                                                                        |
| <b>archive</b>               | See <i>Solaris Flash archive</i> .                                                                                                                                                                                                                                                                                                     |
| <b>audit</b>                 | An action that performs a file-level check of the software contents of a system. An audit consists of two parts: building a baseline manifest and comparing managed hosts against that manifest. Use the audit rules file to specify the type of audit to perform. For instance, perform a full system audit or a per-directory audit. |
| <b>audit rules file</b>      | Rules file used by the audit tool. The audit rules file specifies the files to be placed in the manifest. The audit rules file also specifies which files and file attributes are significant when comparing manifests.                                                                                                                |
| <b>baseline manifest</b>     | A manifest of files on a managed host that you use for comparisons. The baseline manifest often represents the original installation of the software stack. File-level changes that occur within a software stack can be tracked relative to this baseline manifest.                                                                   |

|                                  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
|----------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>boot environment</b>          | <p>The collection of mandatory file systems (disk slices and mount points) and contents that are critical to the operation of the Solaris operating environment. These disk slices might be on the same disk or distributed across multiple disks.</p> <p>The active boot environment is the one that is currently booted. Exactly one boot environment can be the active boot environment. An inactive boot environment is not currently booted, but can be in a state of waiting to be activated on the next reboot.</p> <p>Change Manager requires that each managed host have no more than two boot environments. The active boot environment contains the currently running system image. The inactive boot environment is available for installation with a new Solaris Flash archive.</p> |
| <b>bread crumb</b>               | <p>In web navigation, an ordered set of links that offers the web site visitor easy navigation through a hierarchy. These links represent the path through the hierarchy to the current web page. The bread crumbs appear in the gray line below the <i>general links area</i>.</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
| <b>Change Manager repository</b> | <p>Location where Change Manager files are stored on the Change Manager server. You can import files to the repository and export them from the repository. You must import files to the repository before they can be used for Change Manager operations. You can import files from other directories on the Change Manager server or from other systems by using NFS.</p>                                                                                                                                                                                                                                                                                                                                                                                                                      |
| <b>Change Manager server</b>     | <p>A system that runs the Change Manager software. This system can be used to install, update, and manage software across a large number of managed hosts. This server stores the software to be installed in the Change Manager repository. The server also stores information about each managed system.</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
| <b>compare manifests</b>         | <p>An action that detects the changes on a managed host by comparing its manifest to a baseline manifest. Compare manifests by using the audit operation.</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
| <b>comparison report</b>         | <p>The output from the audit operation.</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
| <b>custom JumpStart</b>          | <p>A command-line interface that enables you to automatically install several systems, based on JumpStart profiles that you create.</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
| <b>deploy</b>                    | <p>An action that installs software on a clone system by using the Change Manager application.</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
| <b>deployment</b>                | <p>The process of delivering software from a server to another system. In the Change Manager context, deployment means installation of a Solaris Flash archive by using one of the following:</p> <ul style="list-style-type: none"> <li>■ Initial installation</li> <li>■ Reinstallation</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |

- Updating the inactive boot environment on a system with two boot environments

|                                  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
|----------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>deployment finish scripts</b> | Scripts that the software stack creator writes. The finish scripts enable you to customize a newly installed software stack on a managed host at deployment time. These scripts are embedded in the archive and run after installation. The finish scripts are passed the user-defined parameter values set by the Change Manager deployment user.                                                                                                                                         |
| <b>DNS</b>                       | Domain Name System. A naming service method by which Internet domain names are translated into IP addresses.                                                                                                                                                                                                                                                                                                                                                                               |
| <b>export</b>                    | An action that copies a file from the Change Manager repository to another system on the network or to a directory outside the repository. The files that can be exported from the Change Manager repository are: Solaris Flash archives, shared profiles, manifests, audit rules files, and reports.                                                                                                                                                                                      |
| <b>fallback</b>                  | A reversion to the environment that ran previously. Use fallback if the updated boot environment fails to boot or shows some undesirable behavior.                                                                                                                                                                                                                                                                                                                                         |
| <b>folder</b>                    | A container that can hold files and other folders. Use folders to organize files such as Solaris Flash archives and shared profiles.                                                                                                                                                                                                                                                                                                                                                       |
| <b>general links area</b>        | The information at the top of web pages in the browser interface. The general links area contains tabs with which you can navigate through Change Manager tasks. The general links area also contains general links for help and to log out.                                                                                                                                                                                                                                               |
| <b>halt</b>                      | An action that stops a running operating system.                                                                                                                                                                                                                                                                                                                                                                                                                                           |
| <b>host</b>                      | Any hardware system or device that is accessible over the network. A host can be a managed host, a clone system, or another network device, such as a router.                                                                                                                                                                                                                                                                                                                              |
| <b>host group</b>                | A container that can hold managed hosts and other host groups.                                                                                                                                                                                                                                                                                                                                                                                                                             |
| <b>host properties</b>           | The properties associated with a managed host. The property values define how the managed host is to be installed with the specified Solaris Flash archive. These host properties can be used in conjunction with a shared profile. A host property value overrides the value of the same property assigned in the shared profile. Use this mechanism when a managed host requires a slightly different configuration than the rest of the managed hosts that use the same shared profile. |
| <b>import</b>                    | An action that copies an object to the Change Manager repository. The objects that can be imported to the Change Manager repository are: Solaris Flash archives, Solaris boot images, shared profiles, manifests, and audit rules files.                                                                                                                                                                                                                                                   |

|                                         |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
|-----------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                                         | The Change Manager repository is on the Change Manager server, but not all files on the server are in the repository.                                                                                                                                                                                                                                                                                                                                                                                |
| <b>initial installation</b>             | <p>The first installation of a Solaris Flash archive on a system. This installation deploys Solaris software to the system for the first time. Part of the initial installation is to create two boot environments so that subsequent installations can use the Solaris Live Upgrade feature.</p> <p>Performing an initial installation is a two-part process. First, set up the files for installation in the Change Manager repository. Then, initiate the installation from the managed host.</p> |
| <b>IP address</b>                       | In TCP/IP, a unique 32-bit number that identifies each system in a network. The address must contain four sets of numbers separated by periods, for example 192.168.1.1.                                                                                                                                                                                                                                                                                                                             |
| <b>job</b>                              | A task that runs on a managed host or on the Change Manager server. Some Change Manager jobs are initial installation, update, audit, import, and export.                                                                                                                                                                                                                                                                                                                                            |
| <b>job ID</b>                           | Job identification number generated by the Change Manager when a command is initiated.                                                                                                                                                                                                                                                                                                                                                                                                               |
| <b>job log</b>                          | File that contains information about jobs. A log entry is made when the job starts. Another log entry is made when the job completes. If a job encounters problems, the problem is also reported to the log.                                                                                                                                                                                                                                                                                         |
| <b>job queue</b>                        | A list of current and recent jobs. A user can clean up the job queue by purging completed jobs. From the job queue, a user can cancel running or pending jobs.                                                                                                                                                                                                                                                                                                                                       |
| <b>Kerberos admin server</b>            | The Kerberos server that corresponds to the particular Kerberos realm.                                                                                                                                                                                                                                                                                                                                                                                                                               |
| <b>Kerberos key distribution center</b> | The Kerberos server that stores the principal and policy databases.                                                                                                                                                                                                                                                                                                                                                                                                                                  |
| <b>Kerberos realm</b>                   | Part of the Kerberos name, which corresponds to the Kerberos service that provides authentication for the principal database. For example, you might have a realm for each project organization in your company.                                                                                                                                                                                                                                                                                     |
| <b>Kerberos security</b>                | A method to securely authenticate a request for a service across a network. Kerberos was developed at the Massachusetts Institute of Technology as part of the Athena Project.                                                                                                                                                                                                                                                                                                                       |
| <b>LDAP</b>                             | Lightweight Directory Access Protocol. A software protocol that enables anyone to locate organizations, individuals, and other resources such as files and devices in a given network.                                                                                                                                                                                                                                                                                                               |
| <b>managed host</b>                     | A host that is controlled by Change Manager. Change Manager can “see” other hosts created by Sun Management Center, but these hosts are not necessarily managed hosts. A managed host must be registered for use by the Change Manager and have the Change Manager agent software installed on it.                                                                                                                                                                                                   |

|                          |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
|--------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>manifest</b>          | A list of files on a system. Each file entry includes several file attribute values. The entry attributes can be compared to track system changes. Manifests are created by running the build manifests operation.                                                                                                                                                                                                                                                                                                                                     |
| <b>master system</b>     | A system on which a software stack is installed and configured for the purpose of creating a Solaris Flash archive. The master system should be representative of the systems to which the software stack is to be deployed.                                                                                                                                                                                                                                                                                                                           |
| <b>naming service</b>    | Method of tracking networked objects, such as systems, routers, and printers, on a network. Some naming services are DNS, LDAP, NIS, and NIS+.                                                                                                                                                                                                                                                                                                                                                                                                         |
| <b>network interface</b> | Hardware and software a computer system uses to connect to the network.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
| <b>NIS and NIS+</b>      | Network Information System. A naming service method similar to DNS, but used primarily for local area networks. The NIS and NIS+ naming services were developed by Sun Microsystems, Inc.                                                                                                                                                                                                                                                                                                                                                              |
| <b>object</b>            | A Change Manager object that is managed by the application. Objects include folders, files, host groups, managed hosts, and jobs.                                                                                                                                                                                                                                                                                                                                                                                                                      |
| <b>page</b>              | A web page in which the application displays forms with which the user interacts.                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
| <b>panel</b>             | Separate sections in a web page. For example, the Change Manager wizards use four panels. <ul style="list-style-type: none"> <li>■ A title panel</li> <li>■ A scrolling panel that lists the steps the wizard takes</li> <li>■ A scrolling form panel where you specify parameter values</li> <li>■ A button panel</li> </ul>                                                                                                                                                                                                                          |
| <b>parameter</b>         | A variable name, which is assigned a value. Parameters appear on property pages. Some of the parameters can be changed from the property pages, but many parameters are read-only.                                                                                                                                                                                                                                                                                                                                                                     |
| <b>pending job</b>       | A job that is scheduled to run in the future.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
| <b>platform group</b>    | The general type of a system, for example, <i>sun4u</i> .                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
| <b>probe</b>             | Change Manager uses a private protocol between the Sun Management Center server and agent to perform particular management operations. This protocol relies on a Sun Management Center “probe connection,” which provides a data stream between server and agent. The probe mechanism relies on standard Sun Management Center authentication to ensure proper access to the Change Manager components on the agent. The agent must be properly configured and must be in the appropriate server context before a probe connection can be established. |
| <b>property</b>          | See <i>parameter</i> .                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |

|                                        |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
|----------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>purge</b>                           | An action that removes completed jobs from the job queue. Completed jobs have a status of canceled, complete, or failed.                                                                                                                                                                                                                                                                                                                                                                                      |
| <b>RARP</b>                            | Reverse Address Resolution Protocol. A protocol that allows a system to obtain its IP address by broadcasting its MAC address to the subnet. A server retrieves the corresponding IP address from the <code>/etc/ethers</code> database file and sends the address to the requester.                                                                                                                                                                                                                          |
| <b>reboot</b>                          | An action that restarts a running operating system.                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
| <b>reinstallation</b>                  | <p>An installation of a Solaris Flash archive on a managed host. Unlike an initial installation, reinstallation is initiated by the Change Manager. Therefore, you do not need to initiate the installation manually from the managed host's console. The reinstallation operation requires only one boot environment.</p> <p>The reinstallation operation is useful for disk volume managers because they are not compatible with the Solaris Live Upgrade feature.</p>                                      |
| <b>report</b>                          | The output from one of two operations: an manifest comparison (Audit) or software status check (Get Software Status).                                                                                                                                                                                                                                                                                                                                                                                         |
| <b>repository</b>                      | See <i>Change Manager repository</i> .                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
| <b>router</b>                          | A bridge between two physical networks. Traffic between the networks flows through the router.                                                                                                                                                                                                                                                                                                                                                                                                                |
| <b>server</b>                          | See <i>Change Manager server</i> .                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
| <b>server farm</b>                     | Multiple systems working together to offer specific services.                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
| <b>set up for initial installation</b> | <p>The action of setting up the custom JumpStart files needed to perform an initial installation of a Solaris Flash archive on a system. This action takes information provided in the shared profile and host properties to build the installation files. Also, the managed host is registered as a network installation client of the Change Manager server.</p> <p>When the custom JumpStart files are ready, you can manually initiate the initial installation from the console of the managed host.</p> |
| <b>shared profile</b>                  | A text file that defines a shared set of properties that customizes one or more managed hosts being installed by the Change Manager. The profile is shared by one or more managed hosts. Each shared profile is associated with a Solaris Flash archive. To use the same customizations for a different archive, create a separate shared profile.                                                                                                                                                            |
| <b>shell</b>                           | A programmable command interpreter. The command shell provides direct communication between the user and the operating system. UNIX systems use the C shell, Bourne shell, and Korn shell.                                                                                                                                                                                                                                                                                                                    |
| <b>slice</b>                           | Large portions of a disk set aside for operating systems. Boot environments are disk slices used by the Solaris Live Upgrade feature.                                                                                                                                                                                                                                                                                                                                                                         |

|                                   |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
|-----------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>software stack</b>             | A set of software installed and configured together to provide a solution or to perform a specific function. A software stack must contain at least an operating system. In addition to the operating system, the stack can include middleware and applications.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
| <b>Solaris boot image</b>         | <p>The CD image required by the Change Manager software to perform an initial Solaris installation. This CD image can also be used to troubleshoot Solaris software issues.</p> <p>For an initial installation, the boot image is used by the managed host to boot the Solaris kernel. Then, the clone system runs the installation program from the boot image. For a Solaris Live Upgrade, the boot image is used to run the installation program.</p>                                                                                                                                                                                                                                                                                                                           |
| <b>Solaris Flash archive</b>      | <p>A file that represents a collection of files that were copied from a master system. The file also contains identification information about the archive, such as the name of the archive and the date you created it. When you install an archive on a system, the system then contains the exact configuration of the master system you used to create the archive.</p> <p>Change Manager supports customizable Solaris Flash archives. The archive can be customized if the software stack creator makes software-related parameters available to the Change Manager user interfaces. When you add a managed host, you can specify parameter values on a per-host basis. When you create a shared profile, you can supply parameter values for a number of managed hosts.</p> |
| <b>Solaris Flash installation</b> | An installation method that enables you to install Solaris Flash archives on managed hosts.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
| <b>Solaris Live Upgrade</b>       | A method of upgrading a system in which the service outage time associated with an operating system update is substantially reduced. The inactive boot environment is updated while the operating system continues to run on the active boot environment.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
| <b>topology</b>                   | The logical layout of a network. Change Manager uses a topology that is a tree of host groups and managed hosts. Each domain has a separate topology. The Change Manager topology only reflects the managed hosts and host groups you specify. The topology might not be a complete representation of the network.                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
| <b>transaction log</b>            | A log that shows every action that has been initiated from the Change Manager server, not just the long-running jobs.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
| <b>update</b>                     | The action of installing a Solaris Flash archive on the inactive boot environment by using the Solaris Live Upgrade feature. The update takes place on the inactive boot environment while the system continues to run on the active boot environment.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |

|                |                                                                                                                                                                                                                                                                                       |
|----------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>URL</b>     | Universal Resource Locator. A path to data on the web. Data on a web server can be accessed through URLs that begin with <code>http://pathname</code> . Data on the local system, including NFS mounts, can be accessed through URLs that begin with <code>file:/pathname</code> .    |
| <b>version</b> | Version information about the software running on the system.                                                                                                                                                                                                                         |
| <b>wizard</b>  | An application that steps you through to the completion of a task. Change Manager uses wizards to help you create shared profiles and host properties, or managed hosts. Wizards are comprised of four panels: the title panel, the step panel, the form panel, and the button panel. |



# Index

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## Numbers and Symbols

`$SI_ROOT`, description of, 63

## A

- access Files section
  - procedure, 75, 134
- access Jobs section, procedure, 124
- accessing Hosts section, browser interface
  - procedure, 78
- adding managed hosts
  - browser interface procedure, 79
  - command-line interface procedure, 89
- agent port, changing on a managed host, 89
- agents, installing on master system, 56
- archive parameter file
  - example, 62
  - `ic_cfgparams`, 62
- archive parameters, definition of, 61
- archive parameters file
  - creating, 62
  - file format, 62
  - processing with finish scripts, 62
- audit
  - browser interface procedure, 108
  - command-line interface procedure, 117
  - description of, 98
- audit file properties
  - manifest, 100
  - `RulesFile`, 100
- audit files
  - audit rules file, 99

## audit files (Continued)

- manifest, 100
- purpose of, 98
- report file, 101

## audit procedures

- using the browser interface to audit, 108
- using the browser interface to build manifests, 107
- using the browser interface to create audit rules files, 103
- using the browser interface to get software status, 109
- using the browser interface to import audit rules files, 104
- using the browser interface to import manifests, 104
- using the command-line interface to audit, 117
- using the command-line interface to build manifests, 116
- using the command-line interface to get software status, 118
- using the command-line interface to import audit rules files, 112
- using the command-line interface to import manifests, 113

## audit rule blocks

- global block, 178
- heir block, 178
- local block, 178

## audit rules file

- `.bmft` suffix, 100
- `.brul` suffix, 100

- audit rules file (Continued)
  - CHECK statement, 177
  - comments and lines that are ignored, 177
  - description of, 97, 99
  - example, 180
  - file attributes, 180
  - file format, 177
  - file syntax, 177
  - IGNORE statement, 177
  - ordering CHECK and IGNORE statements, 178
  - pattern matching statements, 179
  - pattern matching with AND, 179
  - pattern matching with OR, 179
  - rule blocks, 178
  - subtree specifications, 178
- audit tasks
  - auditing, 98
  - building manifests, 98
  - comparing against a baseline manifest, 98
  - getting software status, 98
- auditing software configurations
  - browser interface task map, 102
  - command-line interface task map, 111
  - using the browser interface, 103
  - using the command-line interface, 112

## B

- .bmft suffix
  - audit rules file suffix, 100
  - manifest suffix, 133
- boot environment, using for updates, 67
- boot environments
  - specifying one with shared profile parameters, 176
  - specifying two with shared profile parameters, 176
- browser interface navigation
  - bread crumbs in general links area, 192
  - drop-down menus, 193
  - Files tab in general links area, 186
  - general links area, 185
  - Help button in general links area, 185
  - Hosts tab in general links area, 188
  - Jobs tab in general links area, 189
  - Log Out button in general links area, 185

- browser interface navigation (Continued)
  - Logs tab in general links area, 190
  - navigating folders and host groups, 193
  - navigating wizards, 194
  - section tabs in general links area, 186
- browser interface procedures
  - logging in, 46
  - obtaining glossary definitions, 49
  - obtaining help, 49
- .brul suffix
  - audit rules file suffix, 100, 133
- build manifests
  - browser interface procedure, 107
  - command-line interface procedure, 116

## C

- cancel jobs
  - procedure, 124, 129
- Change Manager
  - audit software, 97
  - deployment technologies used by, 66
  - high-level task map, 20
  - high-level work flow, 20
  - main features of, 20
  - purpose of, 19
- Change Manager agent, installing on master system, 59
- Change Manager audit files, 98
  - audit rules file, 99
  - manifest, 100
  - purpose of, 98
  - report file, 101
- Change Manager audit software, 97
- Change Manager deployment files, 68
  - folder, 72
  - purpose of, 68
  - shared profile, 69
  - Solaris boot image, 71
  - Solaris Flash archive, 71
- Change Manager deployment technologies, 66
  - custom JumpStart, 68
  - Solaris Flash installation, 67
  - Solaris Live Upgrade, 67
- Change Manager repository
  - organizing folders and files, 68, 98
- Change Manager security, 207

- Change Manager security (Continued)
  - browser to user interface, 208
  - Change Manager data storage, 210
  - initial installations using bootparams, 213
  - initial installations using RARP, 213
  - initial installations using TFTP, 214
  - NFS access by managed hosts, 214
  - secure communication channels, 208
  - secure file transfer channels, 208
  - secure file transfers, 209
  - Sun Management Center probe
    - connection, 212
  - Sun Management Center SNMP control, 211
  - terminal access, 215
  - user interfaces to Change Manager, 210
  - users as security risks, 207
- Change Manager server
  - definition of, 25
  - files stored on, 25
  - hardware and software requirements, 26
  - purpose of, 25
- Change Manager server installation
  - disabling SNMP to resolve port conflict, 42
  - high-level task map, 33
  - installing Change Manager server
    - software, 40
  - installing Sun Management Center 3.0, 35
  - installing Sun Management Center 3.0 jumbo
    - patch, 39
  - manually starting web server, 42
  - procedures, 35
  - reinstalling Change Manager software, 43
  - uninstalling Change Manager software, 42
- Change Manager system types
  - Change Manager server, 25
  - managed host, 28
  - master system, 27
- Change Manager topology, organizing managed
  - hosts and host groups, 147
- Change Manager user access, authorizing
  - users, 45
- Change Manager users, 22
  - deployment user, 22
  - server administrator, 22
  - software stack creator, 23
- changemgr(1MCM)
  - command-line interface, 49, 84, 127, 138
- CHECK statement, audit rules file, 177
- cmgetprop(1MCM)
  - description of, 63
  - example, 63
- .cmsp suffix
  - shared profile suffix, 70, 133
- command-line interface
  - changemgr(1MCM), 49, 84, 127, 138
- command-line interface procedures, 49
  - adding managed hosts, 89
  - auditing, 117
  - authenticating users, 52
  - building manifests, 116
  - cancelling jobs, 129
  - copying managed hosts, 159
  - creating folders, 139
  - creating host groups, 158
  - deleting files and folders, 142
  - exporting files, 140
  - falling back, 94
  - getting software status, 118
  - halting, 95
  - importing archives, 87
  - importing audit rules files, 112
  - importing boot images, 85
  - importing manifests, 113
  - importing shared profiles, 88
  - modifying file and folder properties, 145
  - modifying host group properties, 166
  - modifying managed host properties, 164
  - moving files and folders, 141
  - moving managed hosts and host
    - groups, 160
  - performing an initial installation, 91
  - purging completed jobs, 130
  - rebooting, 95
  - reinstalling, 92
  - removing managed hosts and host
    - groups, 161
  - renaming files and folders, 139
  - renaming managed hosts and host
    - groups, 159
  - specifying the administrative domain, 157
  - starting interactive session, 50
  - updating, 93
  - viewing file and folder properties, 144
  - viewing folder contents, 142
  - viewing host group contents, 161
  - viewing host group properties, 166

- command-line interface procedures (Continued)
  - viewing job status, 127
  - viewing managed host properties, 163
- comparison report, file format, 184
- copy files, procedure, 135
- copy managed hosts
  - procedure, 153, 159
- create audit rules files, browser interface
  - procedure, 103
- create folders
  - procedure, 134, 139
- create host groups
  - procedure, 152, 158
- creating shared profiles, browser interface
  - procedure, 77
- creating software stack, on master system, 55
- custom JumpStart
  - using to perform initial installations, 68
  - using to perform reinstallations, 68
  - using to perform updates, 68

## D

- default file properties, 69, 99
  - Description, 69, 99
  - Owner, 69, 99
  - State, 69, 99
- default host properties, 148
  - AgentPort, 149
  - Description, 149
  - Owner, 149
  - State, 149
- delete files, procedure, 136
- delete files and folders, procedure, 142
- deployment, definition of, 25
- deployment file properties
  - BootImage, 71
  - OSVersion, 71
  - Solaris boot image, 71
  - Solaris Flash archive, 71
- deployment files
  - folder, 72
  - purpose of, 68
  - shared profile, 69
  - Solaris boot image, 71
  - Solaris Flash archive, 71

- deployment finish scripts
  - definition of, 27
  - using to create customizable software stacks, 27
- deployment procedures
  - accessing Files section, 75
  - accessing Hosts section, 78
  - adding managed hosts, 79
  - using the browser interface to create shared profiles, 77
  - using the browser interface to fall back, 82
  - using the browser interface to import archives, 77
  - using the browser interface to import boot images, 76
  - using the browser interface to import shared profiles, 78
  - using the browser interface to perform initial installations, 80
  - using the browser interface to reboot, 82
  - using the browser interface to reinstall, 81
  - using the browser interface to update, 81
  - using the command-line interface to add managed hosts, 89
  - using the command-line interface to fall back, 94
  - using the command-line interface to halt, 95
  - using the command-line interface to import archives, 87
  - using the command-line interface to import boot images, 85
  - using the command-line interface to import shared profiles, 88
  - using the command-line interface to perform initial installations, 91
  - using the command-line interface to reboot, 95
  - using the command-line interface to reinstall, 92
  - using the command-line interface to update, 93
- deployment user, tasks performed by, 22
- drop-down menus, browser interface
  - navigation, 193

## E

/etc/ichange.d, location of finish scripts, 62  
export files  
    procedure, 135, 140

## F

fall back, browser interface procedure, 82  
fallback, command-line interface procedure, 94  
file attributes, role in auditing, 180  
file formats  
    archive parameters file, 62  
    audit rules file, 177  
    comparison report, 184  
    manifest, 181  
file name suffixes  
    .bmft, 100, 133  
    .brul, 100, 133  
    .cmsp, 70, 133  
    .flar, 71, 133  
    .miniroot, 71, 133  
    .txt, 101, 133  
Files tab, general links area, 186  
finish scripts  
    \$SI\_ROOT, 63  
    cmgetprop, 63  
    environment variables, 63  
    example, 62  
    location of finish scripts, 62  
    using to process ic\_cfgparams, 62  
    using two or more, 63  
.flar suffix  
    Solaris Flash archive suffix, 71, 133  
flarcreate(1M), using to create Solaris Flash  
    archive, 60  
folder, description of, 72

## G

general links area  
    bread crumbs, 192  
    description of, 185  
    Help button, 185  
    Log Out button, 185  
    section tabs, 186

get software status  
    browser interface procedure, 109  
    command-line interface procedure, 118

## H

halt, command-line interface procedure, 95  
hardware and software integration, definition  
    of, 53  
Help button, general links area, 185  
host groups, definition of, 148  
host properties  
    definition of, 27, 70  
    parameters, 169  
    used to customize software stack  
        installations, 27  
Hosts tab, general links area, 188

## I

ic\_cfgparams  
    archive parameter file, 62  
    location of file, 62  
    processing with finish scripts, 62  
IGNORE statement, audit rules file, 177  
import audit rules files  
    browser interface procedure, 104  
    command-line interface procedure, 112  
import manifests  
    browser interface procedure, 104  
    command-line interface procedure, 113  
importing archives  
    browser interface procedure, 77  
    command-line interface procedure, 87  
importing boot images  
    browser interface procedure, 76  
    command-line interface procedure, 85  
importing shared profiles  
    browser interface procedure, 78  
    command-line interface procedure, 88  
installing agents, task map, 56  
installing Solaris Flash archives  
    browser interface task map, 73  
    command-line interface task map, 83  
    using the browser interface, 75  
    using the command-line interface, 84

interruptable jobs  
description of, 124, 129

## J

job, definition of, 121  
job ID, definition of, 121  
job log, definition of, 122  
job monitoring procedures  
accessing Jobs section, 124  
cancelling jobs, 124, 129  
purging completed jobs, 126, 130  
rescheduling running jobs, 125  
viewing job log, 126  
viewing job queue, 124  
viewing job status, 127  
viewing transaction log, 126  
job queue, definition of, 122  
job status values  
canceled, 122  
cancelling, 122  
complete, 122  
failed, 122  
in the job queue, 122  
pending, 122  
running, 122  
Jobs tab, general links area, 189

## L

Log Out button, general links area, 185  
Logs tab, general links area, 190

## M

maintaining the topology  
browser interface task map, 150  
command-line interface task map, 156  
using the browser interface, 151  
using the command-line interface, 157  
managed host communication, installing and  
configuring agents, 56  
managed hosts  
definition of, 28, 148  
hardware and software requirements, 28

managed hosts (Continued)  
purpose of, 28  
manifest  
description of, 98, 100  
example, 183  
file entries, 181  
file format, 181  
quoting syntax, 183  
master system  
boot environment configuration, 60  
choosing, 54  
creating software stack, 55  
definition of, 27, 54  
hardware and software requirements, 27  
providing runtime data, 60  
purpose of, 27  
restrictions, 54  
supported architecture, 55  
unconfiguring applications, 59  
.miniroot suffix  
Solaris boot image suffix, 71, 133  
modify file and folder properties,  
procedure, 145  
modify host group properties, procedure, 166  
modify managed host properties  
procedure, 155, 164  
monitor jobs, 121  
browser interface task map, 123  
command-line interface task map, 127  
using the browser interface, 124  
using the command-line interface, 127  
using the job log, 122  
using the job queue, 122  
using the transaction log, 123  
move files, procedure, 136  
move files and folders, procedure, 141  
move managed hosts and host groups  
procedure, 154, 160

## N

navigating folders and host groups, browser  
interface navigation, 193  
navigating wizards, browser interface  
navigation, 194

## P

### parameters

- archive parameters, 170
- for disk layout, 173
- for host properties, 169
- for shared profiles, 169, 170
- for system configuration, 170
- managed host properties, 169
- minimum set for software deployment, 176

### performing initial installations

- browser interface procedure, 80
- command-line interface procedure, 91

### purge completed jobs

- procedure, 126, 130

## R

### reboot

- browser interface procedure, 82
- command-line interface procedure, 95

### reinstallation

- browser interface procedure, 81
- command-line interface procedure, 92

### remove managed hosts and host groups

- procedure, 154, 161

### rename files and folders

- procedure, 134, 139

### rename managed hosts and host groups

- procedure, 152, 159

### report file

- description of, 101
- .txt suffix, 101

### repository maintenance

- browser interface task map, 132
- command-line interface task map, 137
- using the browser interface, 133
- using the command-line interface, 138

### repository maintenance procedures

- accessing Files section, 134
- copying files, 135
- creating folders, 134, 139
- deleting files, 136
- deleting files and folders, 142
- exporting files, 135, 140
- modifying file and folder properties, 145
- moving files, 136
- moving files and folders, 141

### repository maintenance procedures (Continued)

- renaming files and folders, 134, 139
- viewing and modifying file properties, 137
- viewing file and folder properties, 144
- viewing folder contents, 136, 142

### reschedule running jobs, procedure, 125

## S

### server administrator, tasks performed by, 22

### shared profile

- .cmsp suffix, 70
- description of, 69
- relationship with host properties, 70

### shared profile parameters

- for disk layout, 173
- for system configuration, 170

### shared profiles

- definition of, 27
- used to customize software stack installations, 27

### software deployment, using software stacks, 20

### software stack creator, tasks performed by, 23

### software stacks

- as Solaris Flash archives, 20
- creating on master system, 27
- creating Solaris Flash archive, 60
- creating to support all hardware, 55
- definition of, 20
- providing runtime data, 60
- unconfiguring applications, 59
- using deployment finish scripts, 27

### Solaris boot image

- description of, 71
- .miniroot suffix, 71

### Solaris Flash archive

- creating customizable, 61, 64
- creating from master system, 60
- definition of, 20
- description of, 71
- .flar suffix, 71

### Solaris Flash installation

- overview, 67
- role of managed host, 67
- role of master system, 67
- role of Solaris Flash archive, 67

- Solaris Flash technology, limitations for applications, 55
- Solaris Live Upgrade
  - proper use of with Change Manager, 60
  - role of boot environments, 67
  - using to create boot environments, 60
- specify the administrative domain, procedure, 157
- subtree specifications, audit rules file, 178
- Sun Management Center agents, installing on master system, 57
- SUNWCXa11, installing on master system, 55

## T

- topology maintenance, 147
  - topology object types, 147
- topology maintenance procedures
  - copying managed hosts, 153, 159
  - creating host groups, 152, 158
  - modifying host group properties, 166
  - modifying managed host properties, 155, 164
  - moving managed hosts and host groups, 154, 160
  - removing managed hosts and host groups, 154, 161
  - renaming managed hosts and host groups, 152, 159
  - specifying the administrative domain, 157
  - viewing host group contents, 155, 161
  - viewing host group properties, 166
  - viewing managed host contents, 163
- topology object types
  - host groups, 148
  - managed hosts, 148
- transaction log, definition of, 123
- troubleshooting
  - browser interface issues, 198
  - Change Manager server installation issues, 195
  - Change Manager user interface issues, 196
  - command-line interface issues, 201
  - general user interface issues, 196
  - software deployment issues, 202
- .txt suffix
  - report file suffix, 101, 133

## U

- update
  - browser interface procedure, 81
  - command-line interface procedure, 93
  - using fallback feature, 67
  - using Solaris Live Upgrade, 67
- user authorization, procedure, 45

## V

- view and modify file properties, procedure, 137
- view file and folder properties, procedure, 144
- view folder contents
  - procedure, 136, 142
- view host group contents
  - procedure, 155, 161
- view host group properties, procedure, 166
- view job log, procedure, 126
- view job queue, procedure, 124
- view job status, procedure, 127
- view managed host properties, procedure, 163
- view transaction log, procedure, 126